1 Chapter

Before Use

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muratec

Sec 1 Introduction

This manual provides operational and specialized information for those operators working with the machine.
Proper machine operation, including proper adjustment and maintenance, will ensure optimum machine performance.
Moreover, operational method can influence the quality of yarn produced as well as machine service life.
Please read this manual entirely in order to maintain the best operating conditions and ensure maximum performance and safe operation.

Sec 2 Operation Notice

- Before operating the machine, please read completely the section entitled <Safety Regulations and Accident Prevention> on the next page.
- Observe all procedures stated in <Safety Regulations and Accident Prevention> when operating the machine.
- There may be slight differences in specifications between the delivered machine and the manual dependent upon design and model type.

This instruction manual must be made available to operators and maintenance personnel at all times. In the event the machine is resold, this instruction manual must accompany the machine to its new destination. The new purchaser must receive training from Murata Machinery Ltd. with respect to operation of the machine. Murata Machinery Ltd. accepts no responsibility for any problem arising from failure to satisfy these conditions.

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The contents of this instruction manual and the machinery described in it are subject to change without prior notice.

Edited by: Documentation Team

Sec 3 Safety Regulations & Accident Prevention

OBEY THE FOLLOWING SAFETY REGULATIONS AT ALL TIMES

WARNING

Failure to observe the following precautions can lead to a fire or electric shock, causing death or serious injury.

1. Safety Cautions

- Regardless of whether or not the machine is in operation, pulling out or plugging in an electrical connector or electrical board while the machine's power is on may generate sparks or cause a fire. Always turn the main switch off before pulling out or plugging in an electrical connector or electrical board.

2. Operation Safety Regulations

- Never operate the machine during heavy thunder storms.

CAUTION

Failure to observe the following precautions can lead to injury, or to damage to the machine or surrounding objects.

1. Safety Cautions

- Note and memorize the position of the emergency stop switches so that you can operate without delay if an emergency occurs.
- Before starting the machine, check around the periphery of the machine and confirm that it is safe to start it.
- Turn the main power switch off, and lock it out before performing any maintenance or adjustments to the machine.
- Turn the machine off at the control panel, and switch off and lock out the main power switch before leaving the machine unattended.
- If a power outage occurs, switch off and lock out the main power switch.
- Never open the machine doors or covers when it is operating.
- Before performing maintenance work, switch off and lock out the main power switch to ensure that the machine cannot accidentally be started.
- Work on motors and other electrical equipment must only be performed by trained and authorized electrical technicians.

2. General Safety Regulations

- This machine must only be operated by personnel who have received instruction and practical training in its operation.
- Strictly obey all safety regulations when operating or performing maintenance on the machine.
- Confirm that all safety equipment used with the machine (protective covers, guards, switches etc.) are functioning correctly before operating the machine.
- Store this instruction manual in a location where it is always accessible to operators and maintenance personnel.
- If, for any reason, an accident occurs, or a situation that you see as being potentially dangerous arises, notify Murata Machinery in writing immediately.

3. Hair and Clothing Regulations

- Operators with long hair must pin their hair up and wear a hairnet to prevent entanglement in the rotating parts of the machine.
- Never wear skirts or loose clothing when operating the machine.
- Depending on machine operating conditions noise levels may exceed 85 dB (A). Operator should wear ear protection while using the machine to prevent hearing loss.

4. Operation Safety Regulations

- Never attempt to remove yarn that has wound onto belts or other rotating parts of the machine while the machine is operating.

5. Maintenance Safety Regulations

- Turn the machine off before cleaning the machine or its periphery.
- After performing maintenance on the machine, ensure that all parts are returned to their initial state (ready for start up).
- After performing maintenance on the machine, be certain to install all covers and guards to their original positions before starting the machine.
- Strictly observe the instructions regarding lubrication (type and amount of lubricant, locations requiring lubrication, and lubrication schedule) in this instruction manual.
- Use only the specified lubricants or products with equivalent ratings.
- Only replace electrical parts with the same parts, or parts with equivalent ratings. Never replace electrical parts while the power is on.
- Fuses must only be replaced by parts with equivalent ratings. Never replace fuses with fuses of greater current capacity, as this may result in damage to the machine.
- Work on motors and other electrical equipment must only be performed by trained and authorized electrical technicians.
- When cleaning the blower impeller, first confirm that the impeller is stopped before starting any work.

6. How to Handle Inverter

Be careful when handling the inverter. Mishandling may cause an accident. When handling, note the following:

- If the input power is connected to terminals U, V, or W of the inverter, the inverter may be damaged.
- A large-capacity electrolytic condenser is used with the inverter. High-voltage electric energy is stored in the circuit for five minutes after the power is turned OFF (until the CHARGE lamp turns off). To avoid accidents such as electric shocks and short circuits, be careful when handling the inverter.

  * When inspecting, cleaning or wiring, wait more than five minutes after turning the power OFF.
- The allowable voltage range is the supply voltage ± 10 % as the specifications indicate. If the voltage is out of this range, the machine may not work. The allowable power frequency variation is ± 1 y%.
- Do not add a power-factor improving condenser. It may damage the inverter.
- Special mechanisms are deployed for the inverter. When the inverter needs to be repaired or replaced, make sure to contact Murata Parts Sales, Ltd. as shown in the “Contact List” at the end of this manual.

7. Replacing the Back-up Lithium Battery

- Make sure to turn OFF the main switch before replacing the battery.

8. Unusable Fibers

- Electrically conductive fibers (carbon fibers and metallic fibers) cannot be used.
  If the yarn fiber (fly waste) contacts the printed circuit board, there is a risk a short circuit could result in damage or incorrect operation of the electrical parts or fire.

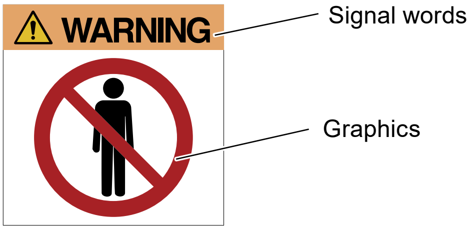
9. Consumable Part Replacement Timing

- Consumable part replacement timing will differ depending on operating conditions.

Sec 4 Safety Stickers (Warning labels)

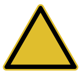
4-1 General Description

- Safety stickers are placed at various locations around the machine to warn operators of potential danger and prevent accidents. The warnings on these stickers must be obeyed at all times.
- Never remove these safety stickers from the machine. If a safety sticker comes off or becomes difficult to read, contact Murata Machinery immediately and request a replacement .

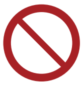


Graphics

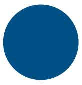
- The graphics of safety stickers have the following meanings.



DANGER SIGN (DANGER)
Indicates a risk of bodily injury



PROHIBITION SIGN (PROHIBITED)
Indicates actions which must not be carried out or which must be stopped



MANDATORY ACTION SIGN (REQUIRED)
Indicates actions required to avoid risks

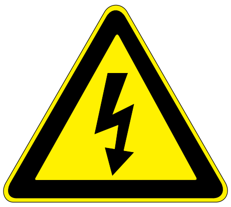
Signal words

- Signal words on safety stickers are categorized as either “DANGER”, “WARNING”, or “CAUTION” depending on the degree of abnormality or risk of bodily harm. Each of the signal words conveys the following meanings.

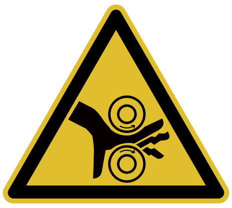
- **DANGER**
  Failure to obey the instructions on the safety sticker may result in death.
- **WARNING**
  Failure to obey the instructions on the safety sticker may result in serious personal injury or damage to the machine.
- **CAUTION**
  Failure to obey the instructions on the safety sticker may result in personal injury or damage to the machine.

4-2 Safety Sticker Types and Meaning

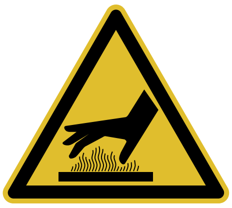
DANGER SIGN (DANGER)



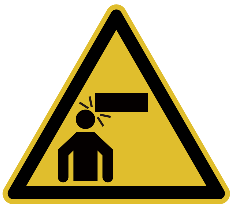
Risk of electrocution
(Electrical hazard)



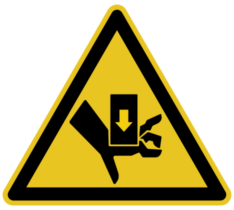
Rotating machinery hazard
(risk of mutilation)



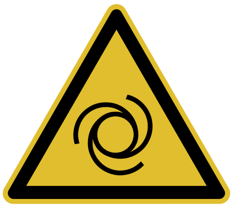
High temperature hazard



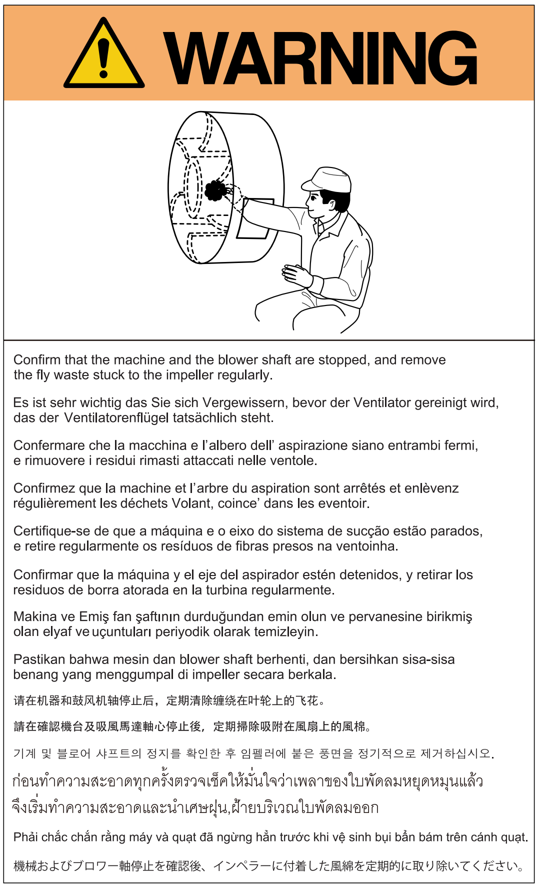
Low head clearance hazard



Crush hazard



Intermittent operation



WARNING

Confirm that the machine and the blower shaft are stopped, and remove the fly waste stuck to the impeller regularly.

Es ist sehr wichtig das Sie sich Vergewissern, bevor der Ventilator gereinigt wird, das der Ventilatorenflügel tatsächlich steht.

Confermare che la macchina e l’albero dell’ aspirazione siano entrambi fermi, e rimuovere i residui rimasti attaccati nelle ventole.

Confirmez que la machine et l’arbre du aspiration sont arrêtés et enlèvenz régulièrement les déchets Volant, coince’ dans les eventoir.

Certifique-se de que a máquina e o eixo do sistema de sucção estão parados, e retire regularmente os resíduos de fibras presos na ventoinha.

Confirmar que la máquina y el eje del aspirador estén detenidos, y retirar los residuos de borra atorada en la turbina regularmente.

Makina ve Emiş fan şaftının durduğundan emin olun ve pervanesine birikmiş olan elyaf ve uçuntuları periyodik olarak temizleyin.

Pastikan bahwa mesin dan blower shaft berhenti, dan bersihkan sisa-sisa benang yang menggumpal di impeller secara berkala.

请在机器和鼓风机轴停止后，定期清除缠绕在叶轮上的飞花。

請在確認機台及吸風馬達軸心停止後，定期掃除吸附在風扇上的風棉。

기계 및 블로어 샤프트의 정지를 확인한 후 임펠러에 붙은 풍면을 정기적으로 제거하십시오.

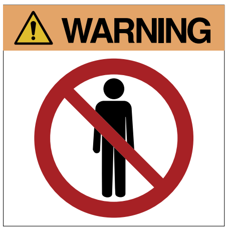
ก่อนทำความสะอาดทุกครั้งตรวจเช็คให้มั่นใจว่าเพลาของใบพัดลมหยุดหมุนแล้ว
จึงเริ่มทำความสะอาดและนำเศษฝุ่น,ฝ้ายบริเวณใบพัดลมออก

Phải chắc chắn rằng máy và quạt đã ngừng hẳn trước khi vệ sinh bụi bẩn bám trên cánh quạt.

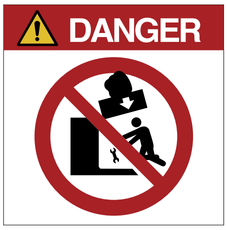
機械およびブロワー軸停止を確認後、インペラーに付着した風綿を定期的に取り除いてください。

Remove fly waste from blower impeller

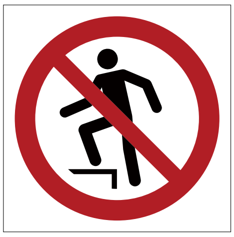
PROHIBITION SIGN (PROHIBITED)



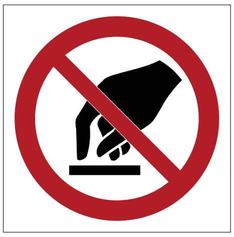
Entry prohibited



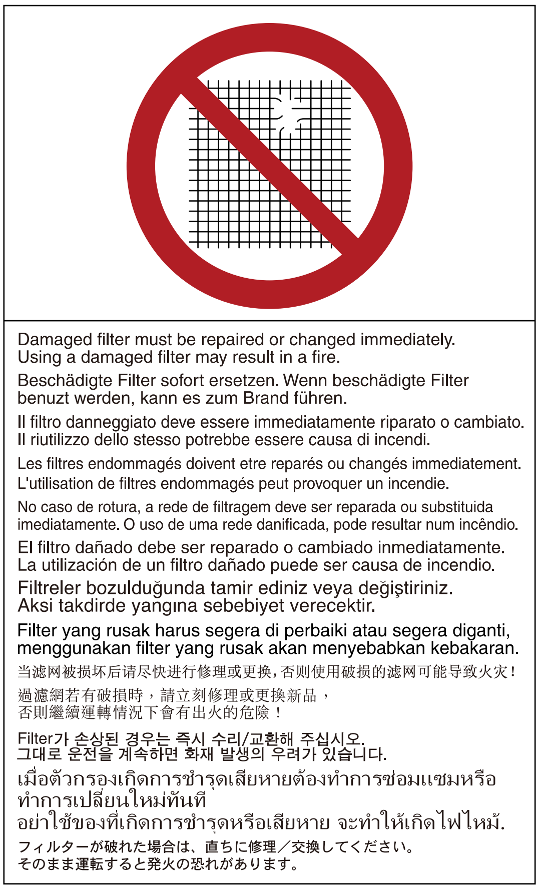
Entry prohibited



No step
(do not step)



Do not touch



Damaged filter must be repaired or changed immediately.
Using a damaged filter may result in a fire.

Beschädigte Filter sofort ersetzen. Wenn beschädigte Filter benuzt werden, kann es zum Brand führen.

Il filtro danneggiato deve essere immediatamente riparato o cambiato.
Il riutilizzo dello stesso potrebbe essere causa di incendi.

Les filtres endommagés doivent etre reparés ou changés immediatement.
L'utilisation de filtres endommagés peut provoquer un incendie.

No caso de rotura, a rede de filtragem deve ser reparada ou substituida imediatamente. O uso de uma rede danificada, pode resultar num incêndio.

El filtro dañado debe ser reparado o cambiado inmediatamente.
La utilización de un filtro dañado puede ser causa de incendio.

Filtreler bozulduğunda tamir ediniz veya değiştiriniz.
Aksi takdirde yangına sebebiyet verecektir.

Filter yang rusak harus segera di perbaiki atau segera diganti, menggunakan filter yang rusak akan menyebabkan kebakaran.

当滤网被损坏后请尽快进行修理或更换，否则使用破损的滤网可能导致火灾！

過濾網若有破損時，請立刻修理或更換新品，
否則繼續運轉情況下會有出火的危險！

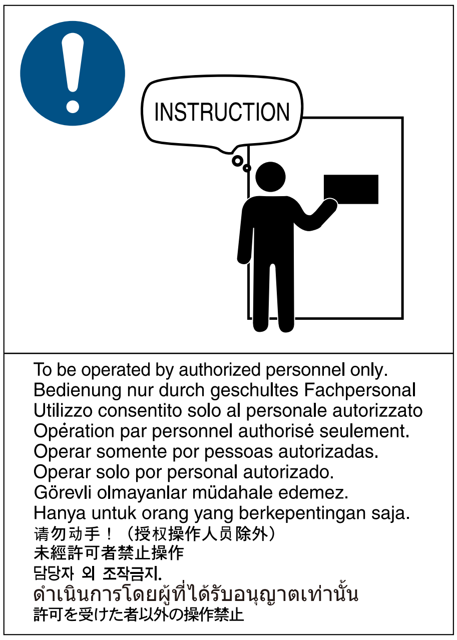
Filter가 손상된 경우는 즉시 수리/교환해 주십시오.
그대로 운전을 계속하면 화재 발생의 우려가 있습니다.

เมื่อตัวกรองเกิดการชำรุดเสียหายต้องทำการซ่อมแซมหรือ
ทำการเปลี่ยนใหม่ทันที
อย่าใช้ของที่เกิดการชำรุดหรือเสียหาย จะทำให้เกิดไฟไหม้.

フィルターが破れた場合は、直ちに修理／交換してください。
そのまま運転すると発火の恐れがあります。

Do not use damaged filters

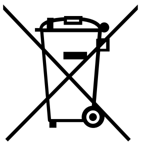
MANDATORY ACTION SIGN (REQUIRED)


INSTRUCTION

To be operated by authorized personnel only.
Bedienung nur durch geschultes Fachpersonal
Utilizzo consentito solo al personale autorizzato
Opėration par personnel authorisė seulement.
Operar somente por pessoas autorizadas.
Operar solo por personal autorizado.
Görevli olmayanlar müdahale edemez.
Hanya untuk orang yang berkepentingan saja.
请勿动手！（授权操作人员除外）
未經許可者禁止操作
담당자 외 조작금지.
ดำเนินการโดยผู้ที่ได้รับอนุญาตเท่านั้น
許可を受けた者以外の操作禁止

To be operated by authorized personnel only

NOTE



This symbol mark is for EU countries only.

This symbol mark is according to the directive 2006/66/EC Article 20 Information for endusers and Annex II.

Your MURATA MACHINERY product is designed and manufactured with high quality materials and components which can be recycled and/or reused.

This symbol means that batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.

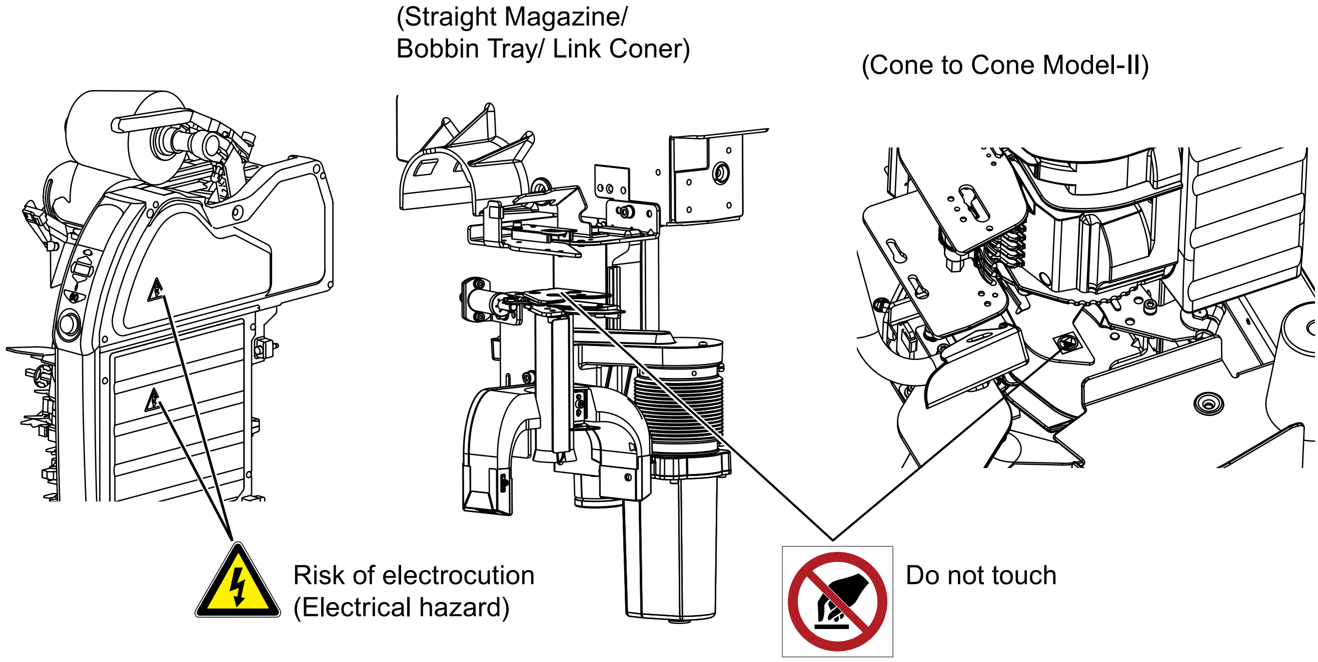
If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration.
This will be indicated as follows:
Hg: mercury (0.0005 %), Cd: cadmium (0.002 %), Pb: lead (0.004 %)

In the European Union there are separate collection systems for used batteries and accumulators. Please, dispose of batteries and accumulators correctly at your local community waste collection/ recycling center.

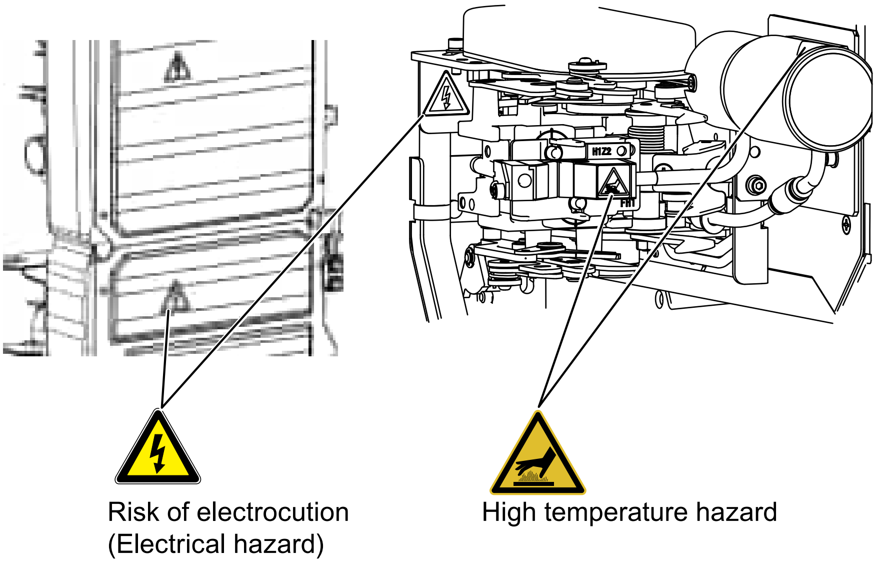
Please, help us to conserve the environment we live in!

Safety Stickers

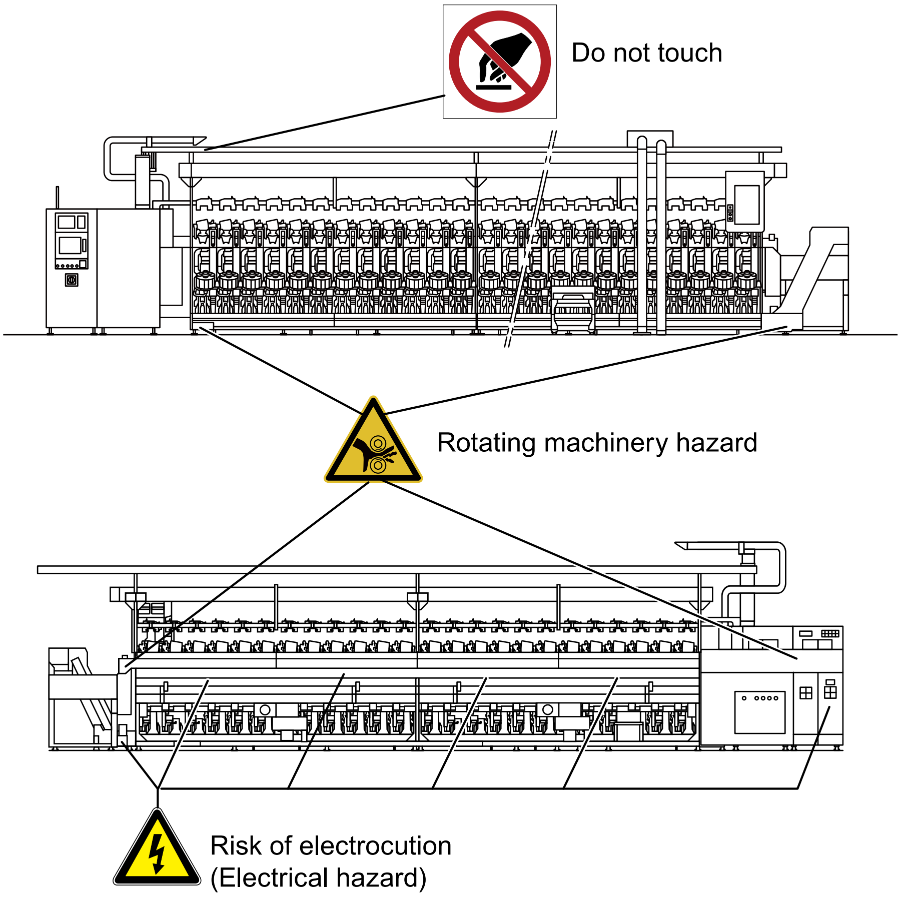
- **Winding unit**


(Straight Magazine/
Bobbin Tray/ Link Coner)
(Cone to Cone Model-II)
Risk of electrocution
(Electrical hazard)
Do not touch

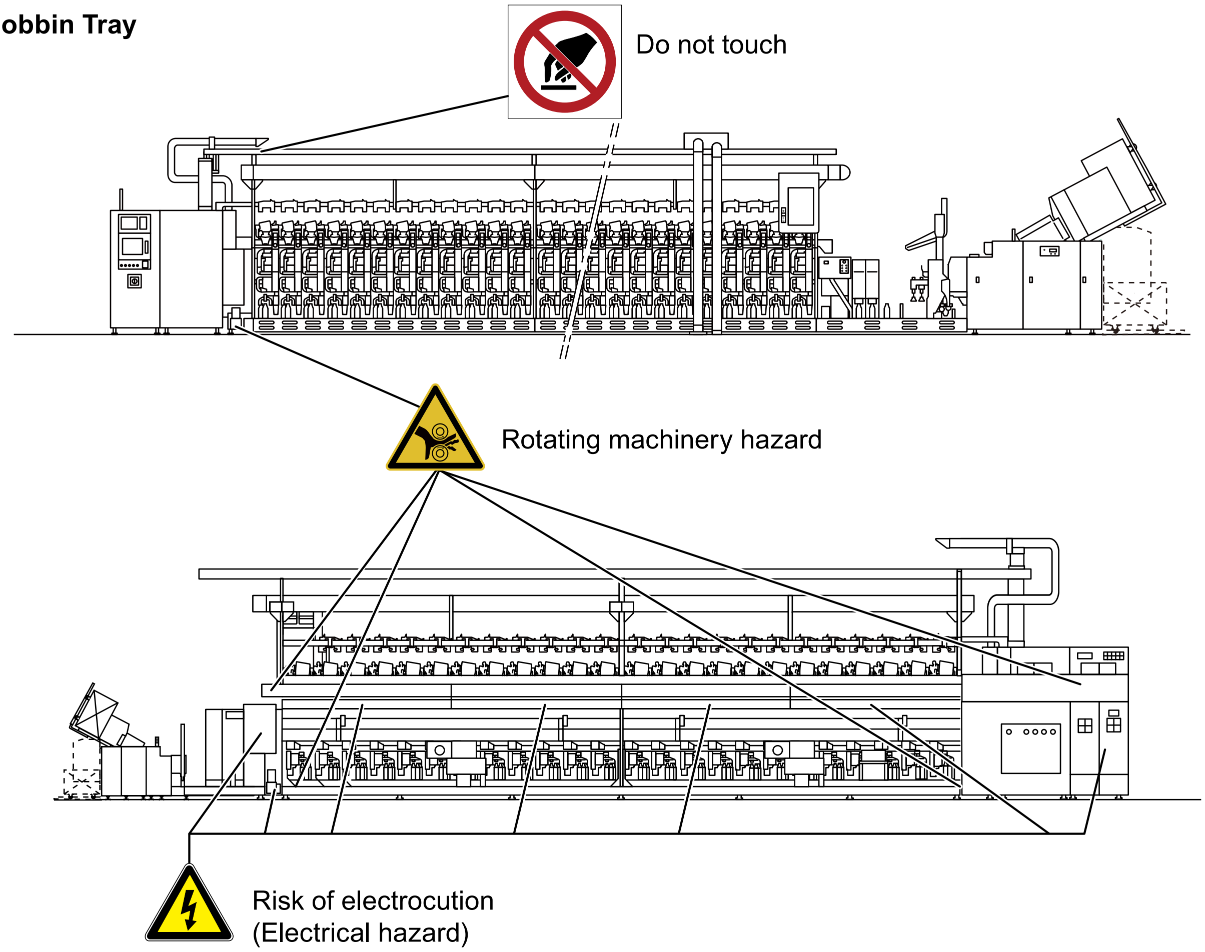
- **Hot splicer specification**


H1Z2
FH1
Risk of electrocution
(Electrical hazard)
High temperature hazard

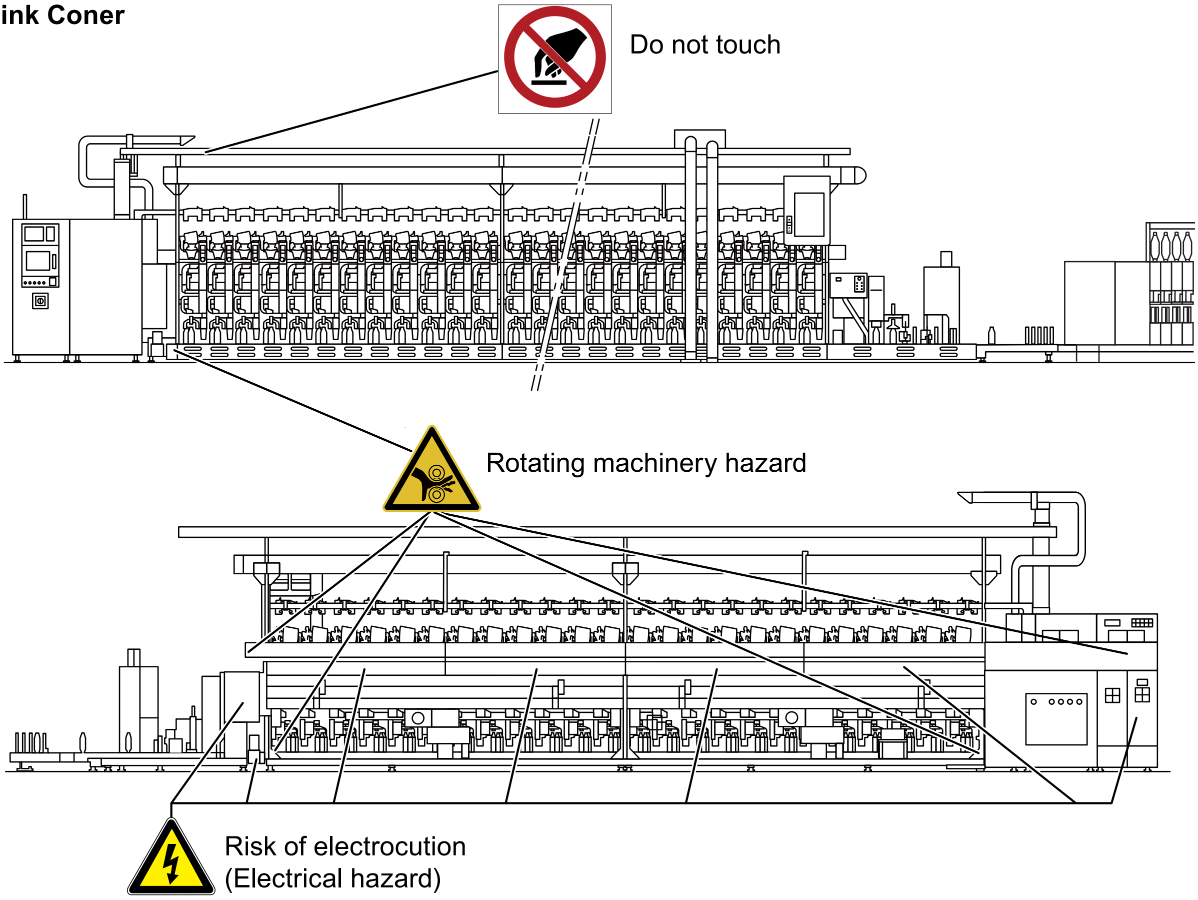
- **Straight Magazine**


Do not touch
Rotating machinery hazard
Risk of electrocution
(Electrical hazard)

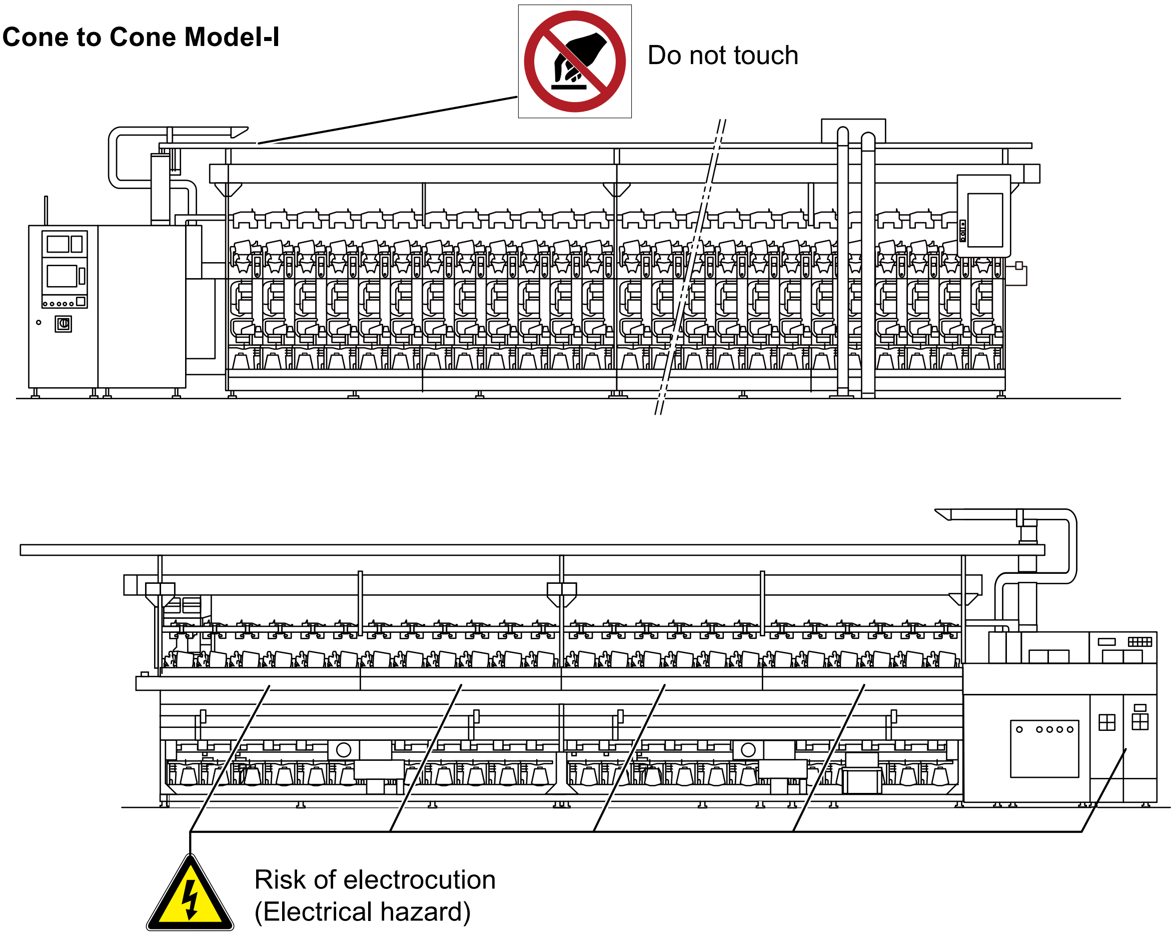
- **Bobbin Tray**


Do not touch
Rotating machinery hazard
Risk of electrocution
(Electrical hazard)

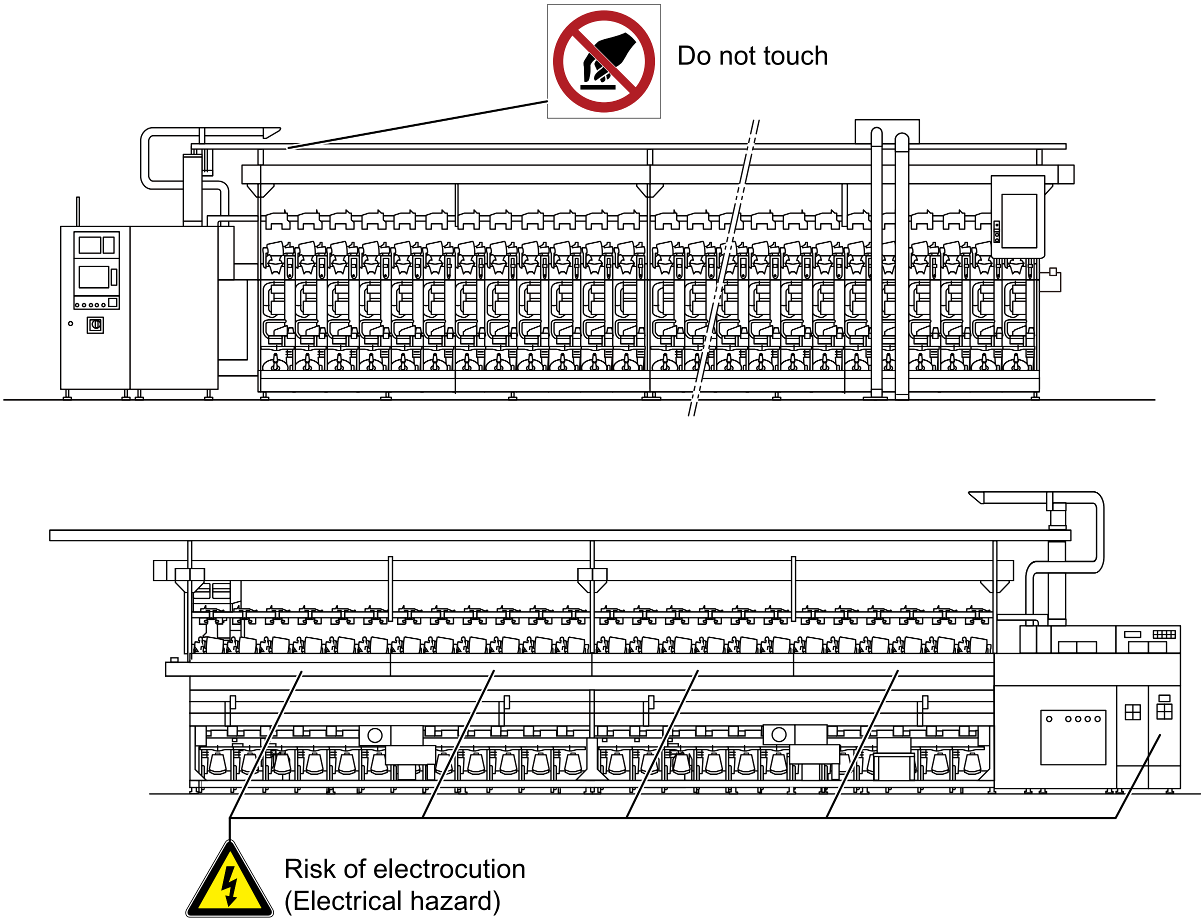
- **Link Coner**


Do not touch
Rotating machinery hazard
Risk of electrocution
(Electrical hazard)

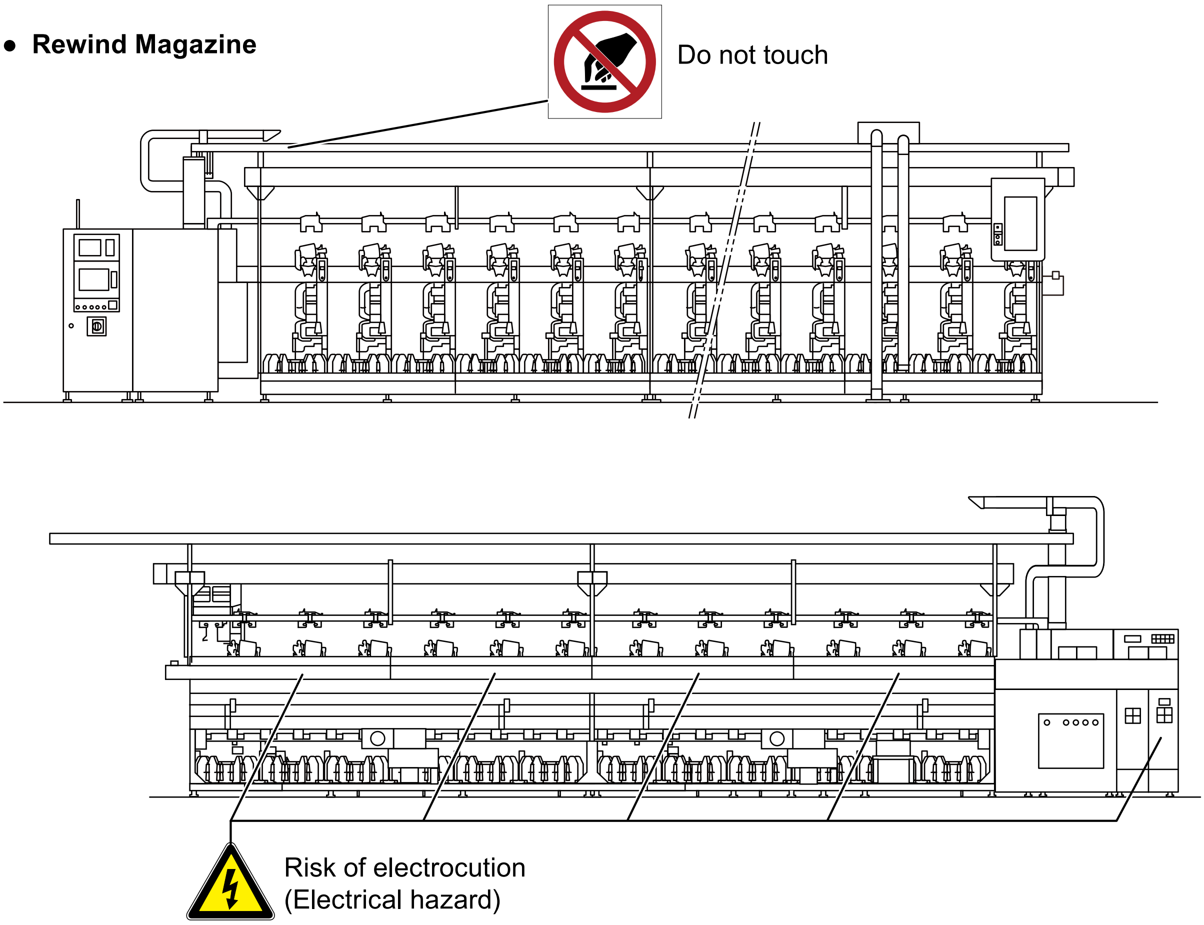
- **Cone to Cone Model-I**


Do not touch
Risk of electrocution
(Electrical hazard)

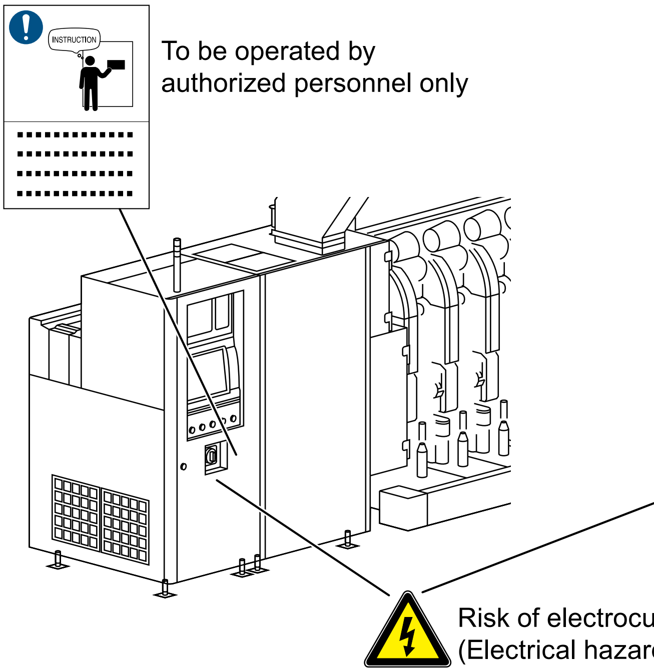
- **Cone to Cone Model-II**


Do not touch
Risk of electrocution
(Electrical hazard)

- **Rewind Magazine**


Do not touch
Risk of electrocution
(Electrical hazard)

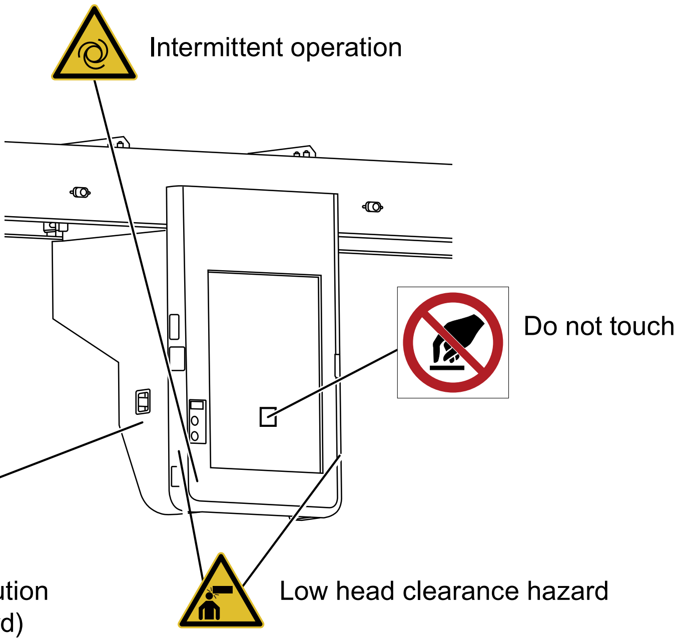
- **Main switch**



To be operated by authorized personnel only

Risk of electrocution (Electrical hazard)

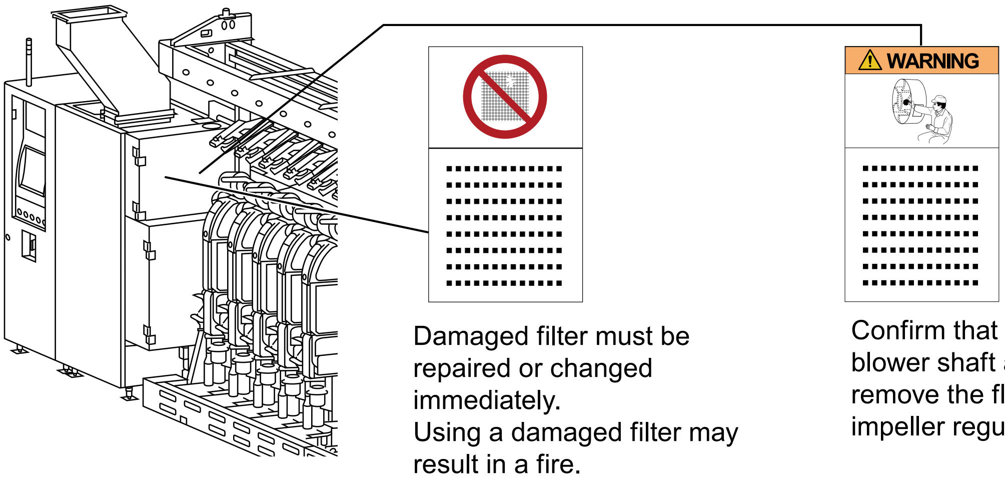
- **AD**



Intermittent operation

Do not touch

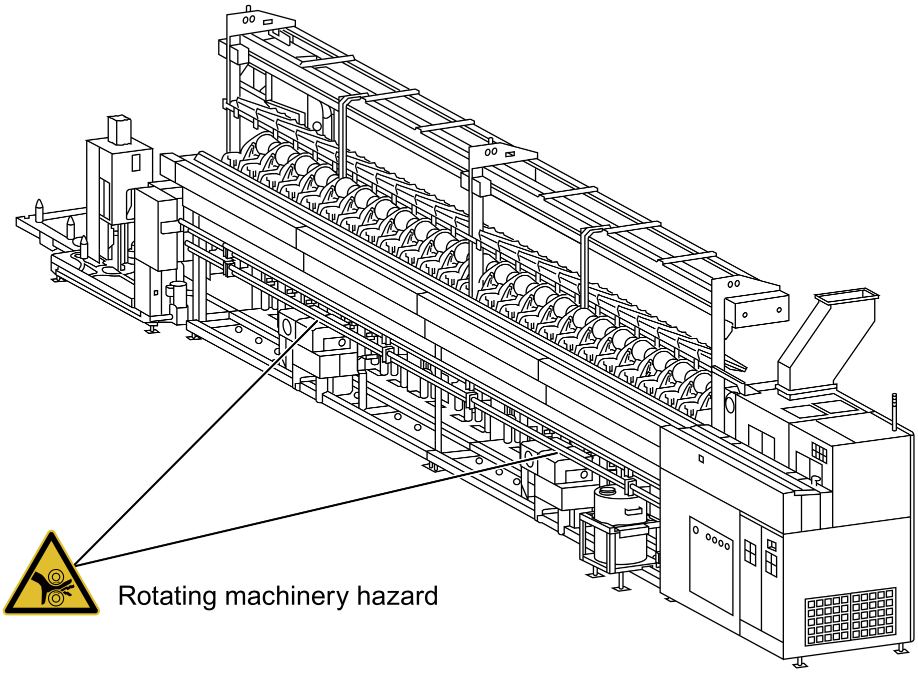
Low head clearance hazard



Damaged filter must be repaired or changed immediately.
Using a damaged filter may result in a fire.

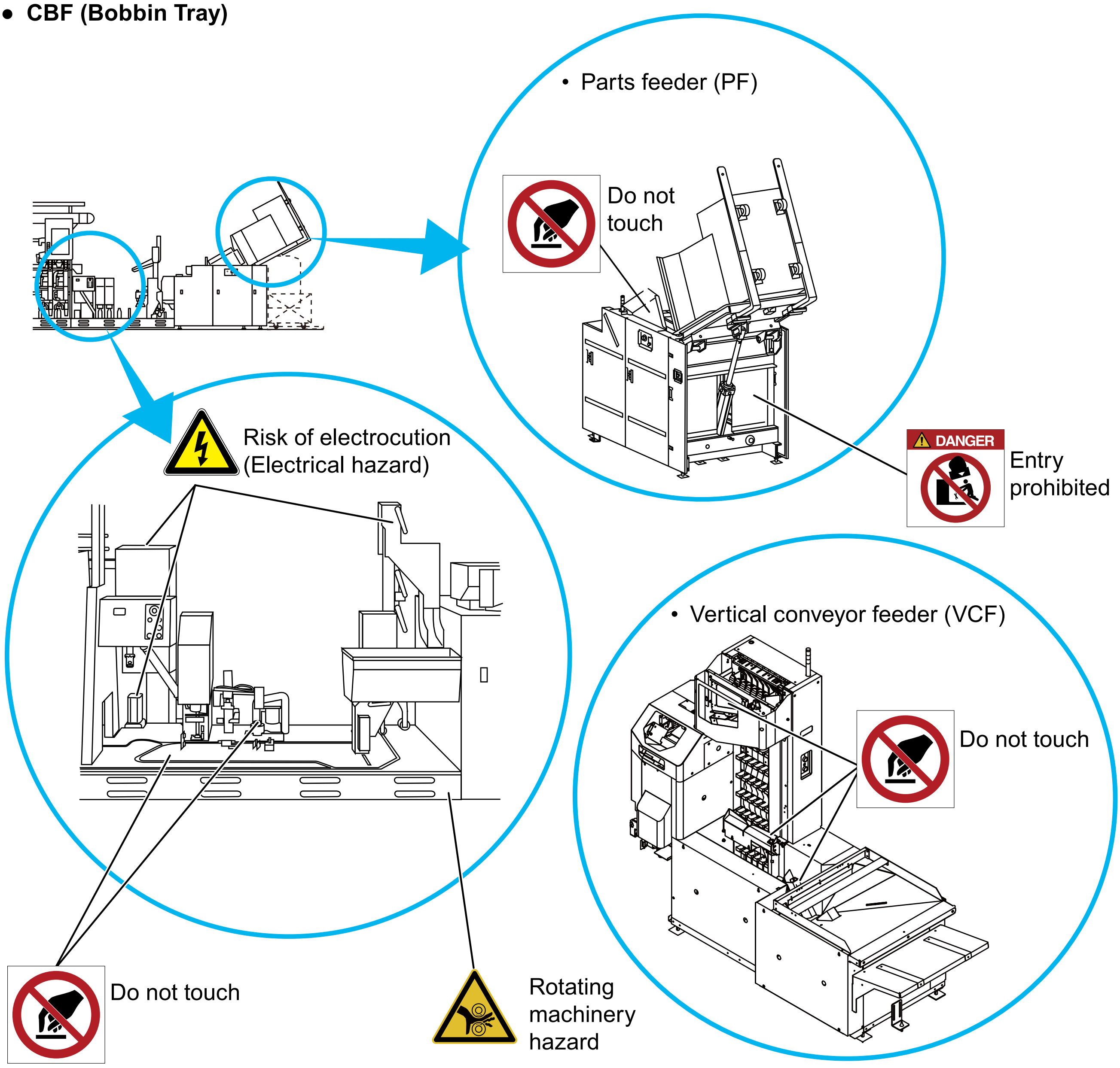
Confirm that the machine and the blower shaft are stopped, and remove the fly waste stuck to the impeller regularly.

- **Dust collector**

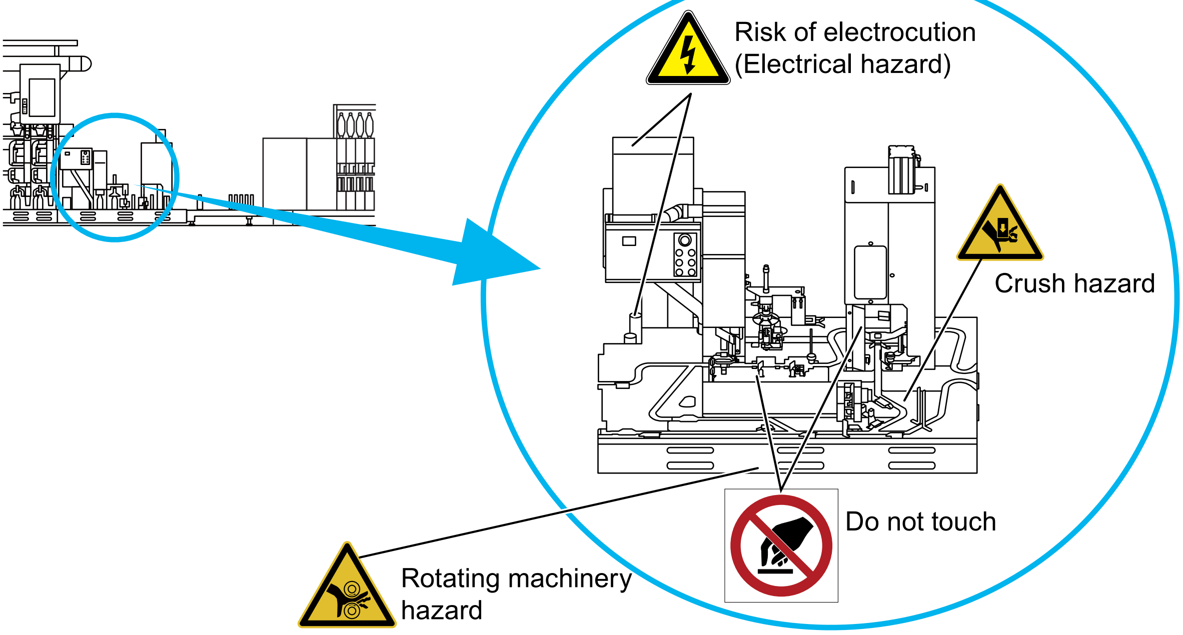


Rotating machinery hazard

- **CBF (Bobbin Tray)**


• Parts feeder (PF)
Do not touch
DANGER
Entry prohibited
Risk of electrocution (Electrical hazard)
• Vertical conveyor feeder (VCF)
Do not touch
Do not touch
Rotating machinery hazard

- **CBF (Link Coner)**


Risk of electrocution (Electrical hazard)
Crush hazard
Do not touch
Rotating machinery hazard

Sec 5 Noise Emission Data

[Measurement Environment]

- Measurements taken at 1 m distance and 1.6 m height from operating position.
- Measuring instrument contains an uncertainty level of 4 dB (A).

[Operating conditions]

Item	Setting value
Winding speed (m/min)	1200
Winding unit	20
Air splicer type(air pressure)	G2Z (0.65 MPa)
Measurement load (frequency of splicing x blower frequency)	1. Low noise (56 Hz & Without splicing) 2. Medium noise (70 Hz & Splicing once/winding unit/min) 3. Maximum noise (81 Hz & Splicing twice/winding unit/min)
Blow cleaner	---
Dust collector	---

[Measuring Result]

Load	Sound intensity level [dB (A)]	Sound power level [dB (A)]
1. Low noise	75.6	---
2. Medium noise	80.9	106
3. Maximum noise	84.0	109

Sec 6 Emergency Stop

Operation Method

If an emergency stop operation is necessary, use one of the following methods to perform the operation.
When this operation is performed, all operations on the machine immediately stop.

- **Turn OFF the main switch on the main control box. (Refer to Chapter 1, 6-1)**
- **Press the emergency stop switch. (Refer to Chapter 1, 6-2)**

CAUTION

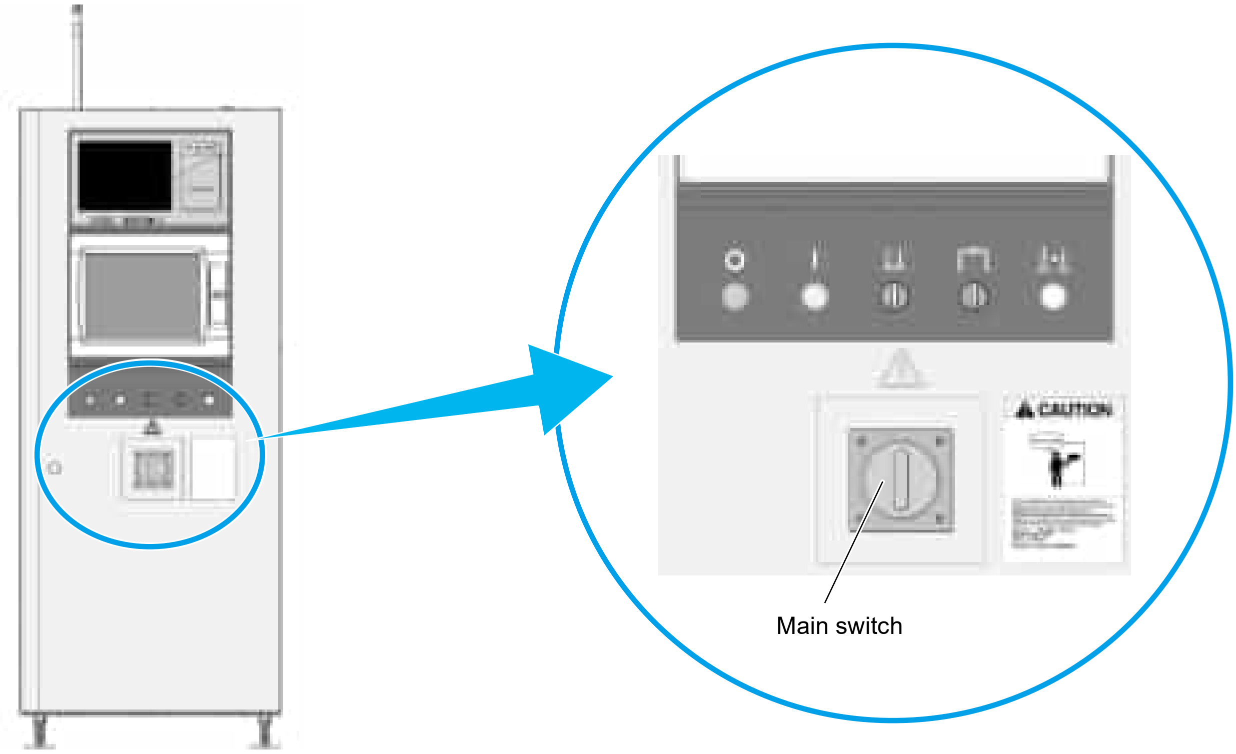
Performing an emergency stop during operation causes undue stress on the machine. As a result, do not perform an emergency stop operation unnecessarily, or unless it is an emergency.

Release Method

When releasing the emergency stop and re-starting the machine, perform the following steps.

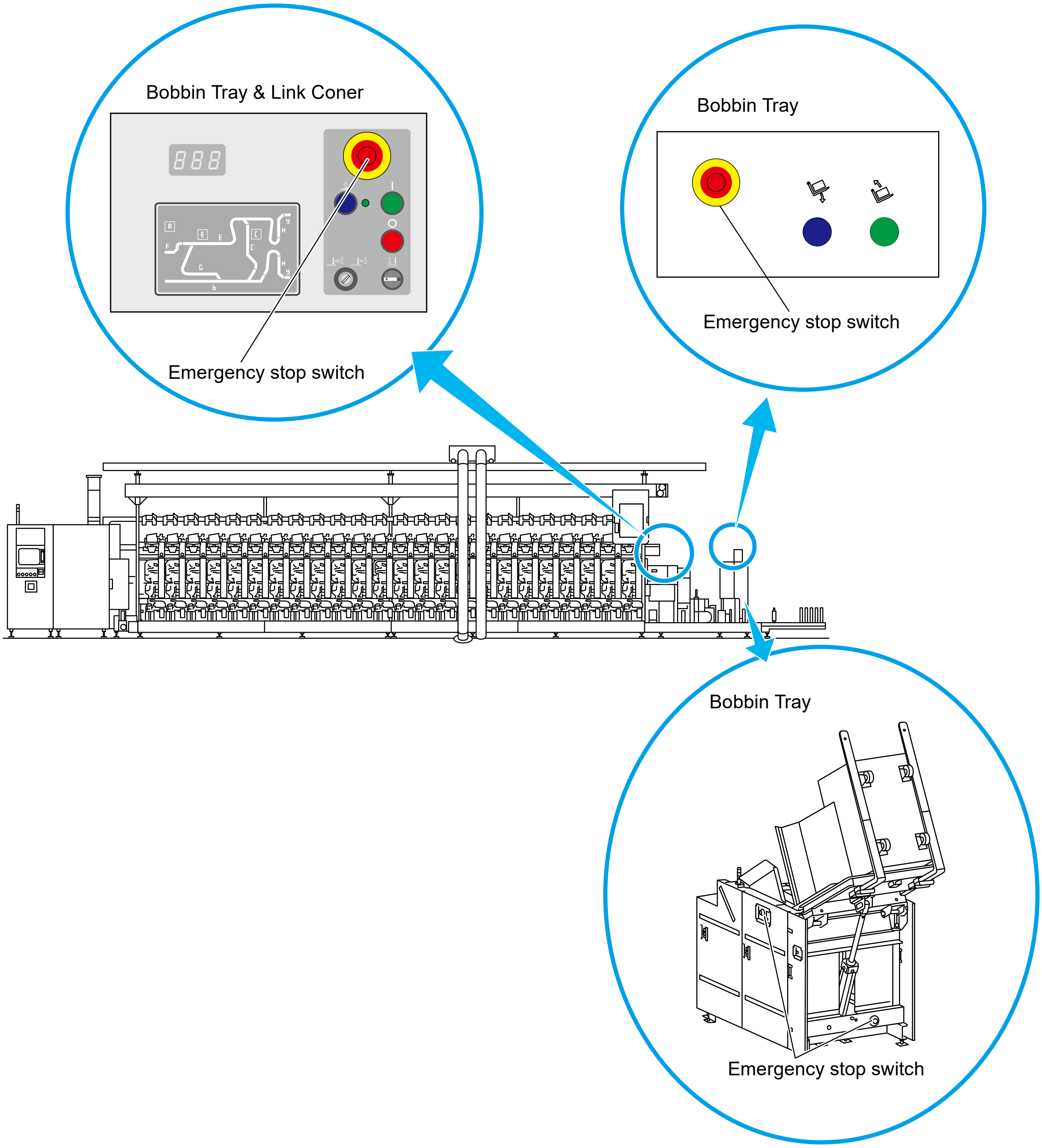
1. **Check the area around the machine to ensure safe operation.**
2. **Make sure the area behind the machine is cleared of all personnel (maintenance, etc.).**
3. **Turn ON the main switch.**
4. **When you perform an emergency stop operation using the emergency stop switch on the CBF or the supply unit, use the same switch to release it.**
5. **Press the start button.**
   The machine operation will re-start.

6-1 Main Switch Location



6-2 Location of Emergency Stop Switches

The machine’s emergency stop switches are located in the following places.


Bobbin Tray & Link Coner
Emergency stop switch
Bobbin Tray
Emergency stop switch
Bobbin Tray
Emergency stop switch

Sec 7 Machine Operation Stopped Due to Power Outage & Lightning Strike

Precautionary Measure Against Lightning

If there is risk of lightning, halt operation and turn the main switch OFF.

Machine Stopped Automatically Due to Power Outage

If the power supply is halted instantaneously by a lightning strike or a problem with the equipment, the machine stops automatically when necessary.

- The main switches on the main control box and each winding unit are equipped with a power supply monitoring function.
- The main switch trips during a power outage.
- If the voltage for the winding unit drops below a set level during winding, the yarn is cut and the drum drive is stopped.

Restarting After Machine Stops Due to Lightning Strike & Power Outage

- **When the main switch has tripped**

1. **Move the main switch from the TRIP position back to the OFF position, and then turn it ON.**
2. **Turn on the machine operation switch.**
   The machine operation will re-start.

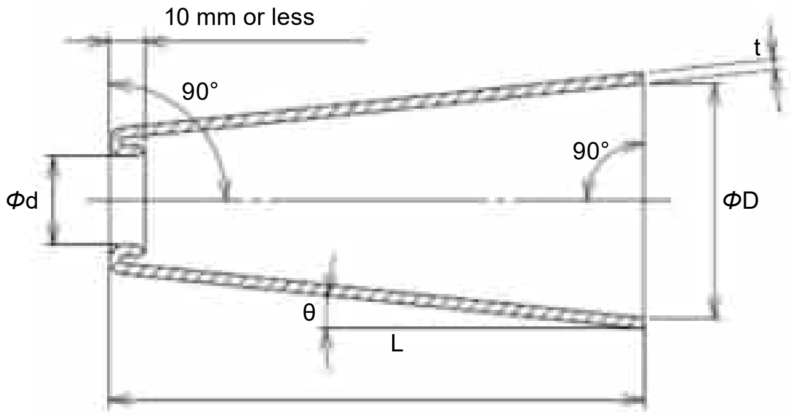
- **When the power supply has suddenly stopped causing the winding unit operation to stop**
  When the winding unit detects that the power supply has stopped because of a lightning strike or a problem with the equipment, the unit stops and indicates an operator call. “ 62 ” is shown on the unit status display.

1. **Press the reset switch on the winding unit.**
   The winding operation re-starts.

Sec 8 Take-up Tube Precautions

The accuracy and strength of the take-up tube are important.
Insufficient accuracy and strength may cause the package to fall off the bearing center during winding. Always use a take-up tube that meets the accuracy and strength requirements.

Accuracy

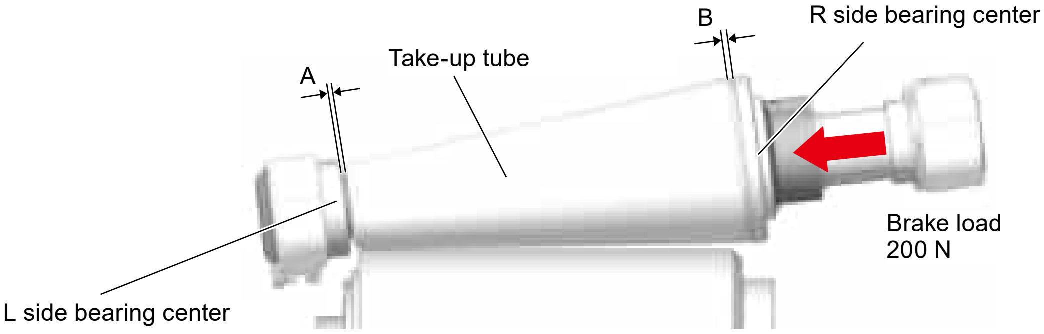


Φd on the L side	Within ± 0.2 mm
ΦD on the R side	Within ± 0.2 mm
Tube length (L)	Within ± 1 mm
Tube wall thickness (t)	2 mm or more (the thickness must be uniform)
Tube fluctuation	0.6 mm or less (range of oscillation when attached to the cradle and rotating)
Tube eccentricity	No eccentricity
Tube end surfaces	Tube end surfaces are 90° relative to the center line

Strength

It is important that the take-up tube can support the package brake load (200 N) and that the inner diameter dimensions do not change (Φd, ΦD). The clearance between the bearing center and the take-up tube must satisfy the following conditions from the start to the end of the winding operation.

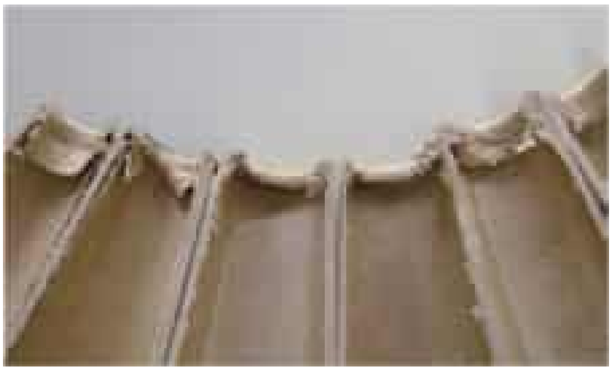
L side bearing center gap	A = 0.5 to 1.5 mm
R side bearing center gap	B = 0.5 to 1.5 mm



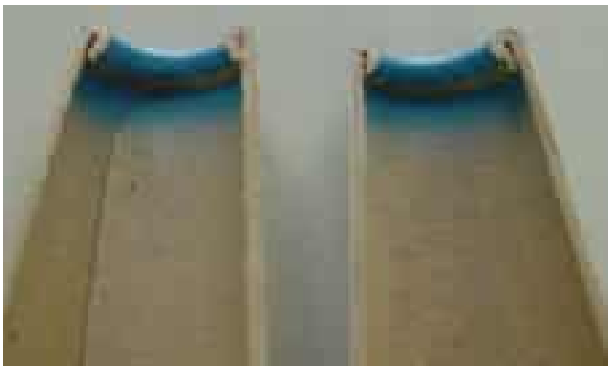
Shape & Condition

- **The L side curve shape and condition must be highly accurate.**

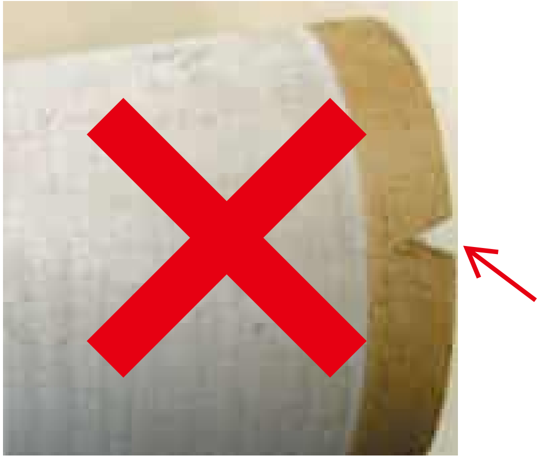
[Bad take-up tube sample]

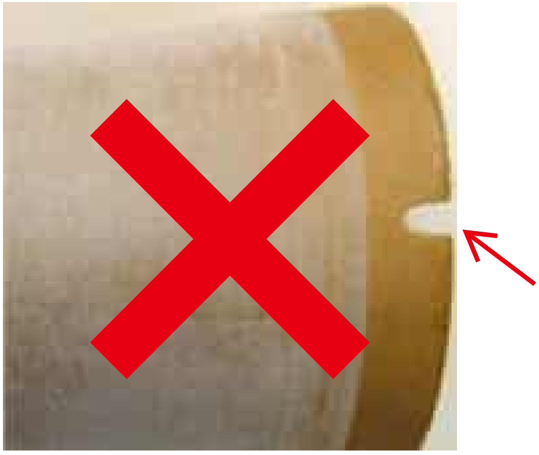


[Good take-up tube sample]



- **The R side should have no cutout.**
  Take-up tubes with a V or U-shaped cutout can easily be deformed when the package brake is activated, increasing the risk for the package to step wind or come off, and therefore their use is not recommended.





2
Chapter

Operation

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- 2-4 Winding Unit Part Names

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Sec 1 Introduction

This chapter-details the proper operating procedures for the “Process Coner II.”
The Process Coner II is a high-performance automatic winder. Although its operation is simple, the Process Coner II requires periodic maintenance to ensure high quality yarn and efficient production.

Please use this chapter as a reference during operation. Some information may vary for your particular operation depending upon the yarn type, the yarn count, and the specifications of the Process Coner II being used at your plant.

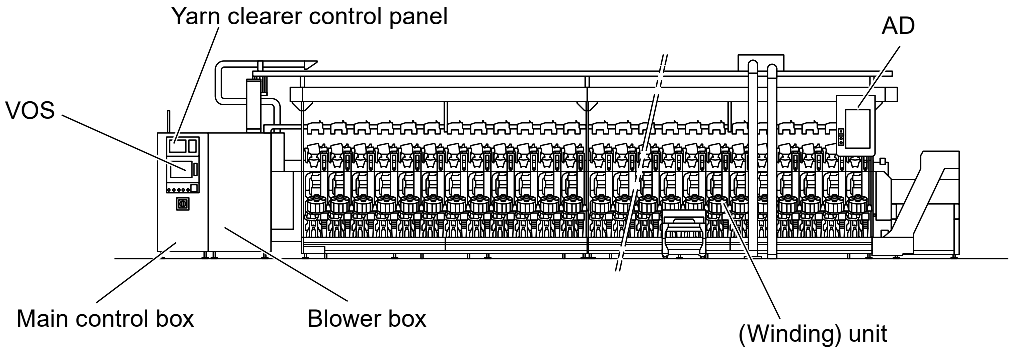
WARNING

When you need to lean several winding units forward at the same time during maintenance, etc., ensure that they are “two winding units apart.” If you lean too many winding units forward simultaneously, the entire frame may lean forward resulting in a serious accident.

Sec 2 Names of Each Part

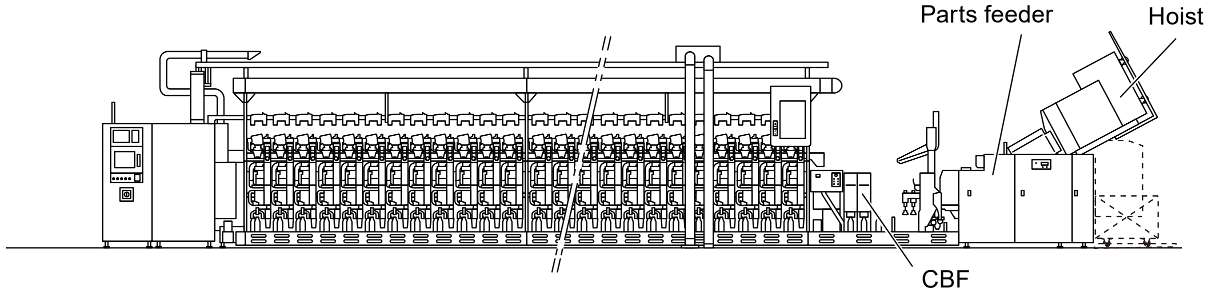
2-1 Machine Part Names

Straight Magazine

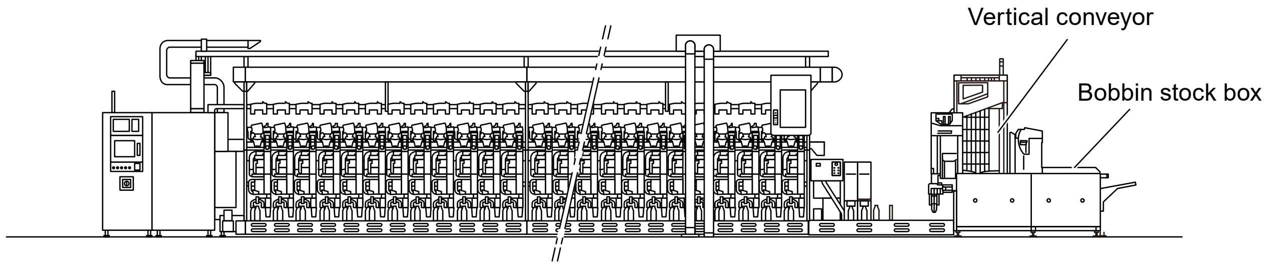

Yarn clearer control panel
AD
VOS
Main control box
Blower box
(Winding) unit

Bobbin Tray

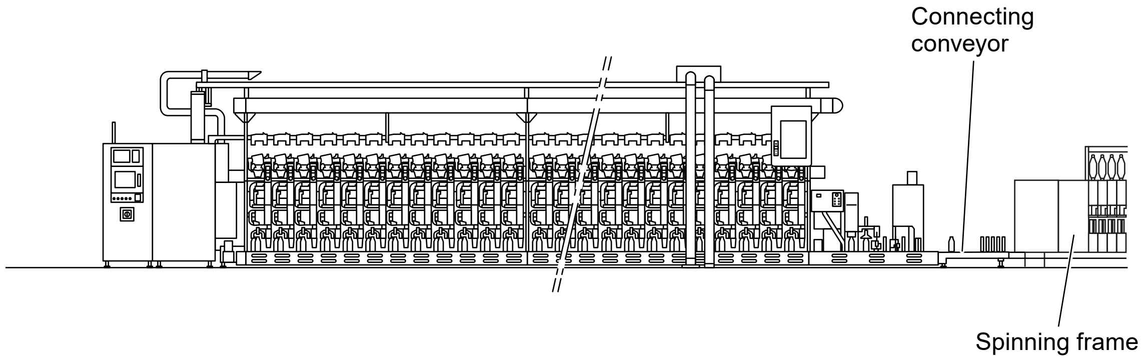
- **Parts feeder**


Parts feeder
Hoist
CBF

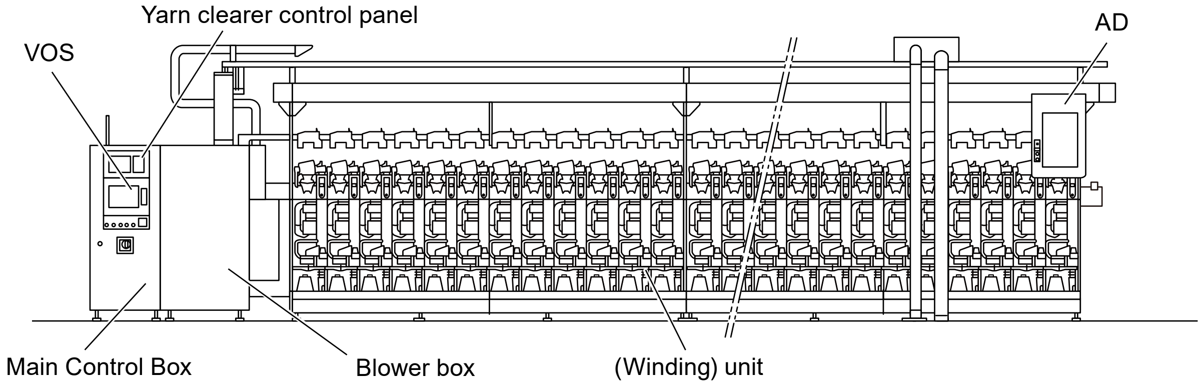
- **Vertical conveyor feeder**


Vertical conveyor
Bobbin stock box

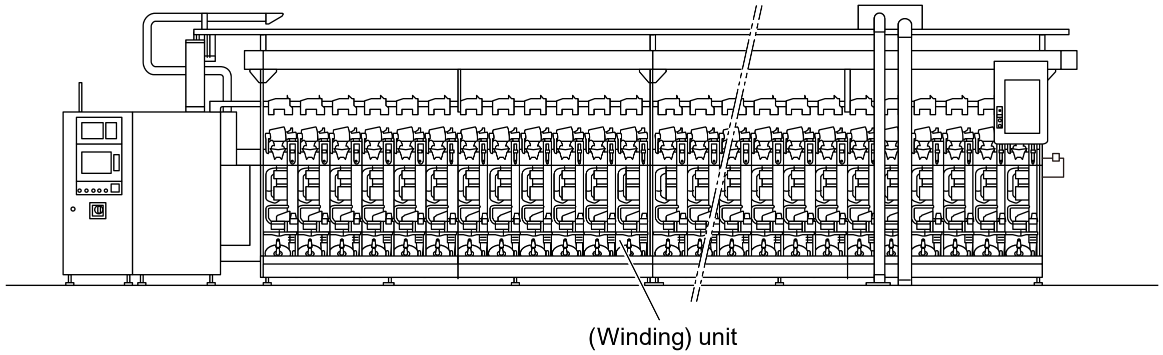
Link Coner


Connecting
conveyor
Spinning frame

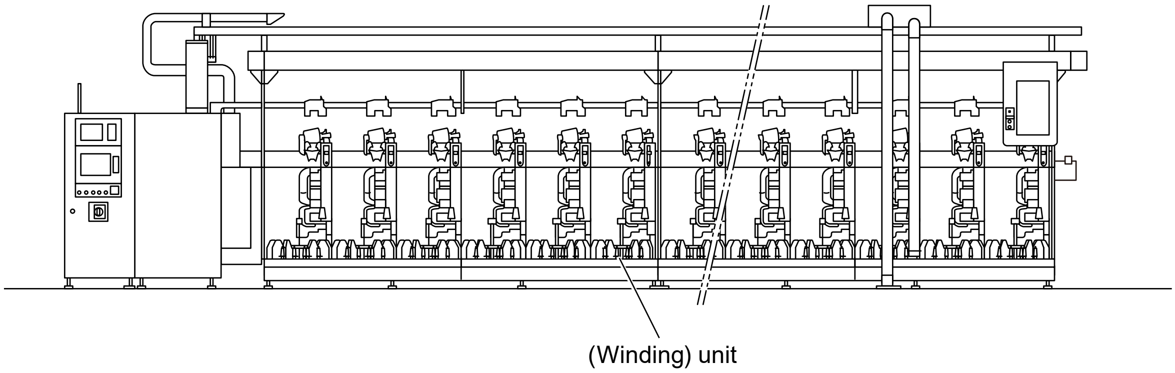
Cone to Cone Model-I


Yarn clearer control panel
VOS
AD
Main Control Box
Blower box
(Winding) unit

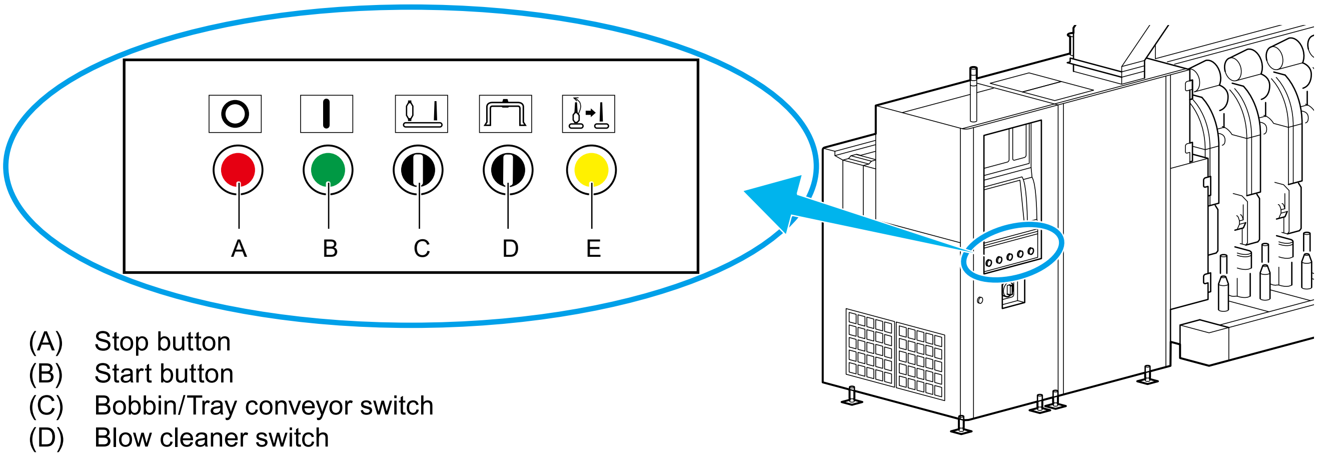
Cone to Cone Model-II


(Winding) unit

Rewind Magazine


(Winding) unit

2-2 Switch Names



(A) Stop button
(B) Start button
(C) Bobbin/Tray conveyor switch
(D) Blow cleaner switch
(E) Cleaning mode button

2-3 Signal Tower Indications

[The signal tower on top of the main control box]

	Lit	Flashing	
		At 0.2-second intervals	**At 2-second intervals**
Red	- CBF error - AD error	PC-LINK alarm	Fixer call
Yellow	Waiting for spinning-bobbins from the spinning frame	---	Spinning frame problem
Green	Operating	---	In cleaning mode (CYCLE STOP)

[The out end (OE) signal tower of the winder]

	Flashing		
	At 0.2-second intervals	**At 1-second intervals**	**At 2-second intervals**
Red	- Emergency stop - Machine alarm - Unit fixer call*[1] - Feed conveyor problem - CBF error - Steam setter problem	CBF bypass line full (for Bobbin Tray only)	Spinning frame problem
Yellow	- Unit operator call*[2] - Package conveyor alarm - CBF bypass line full - Spin inspector conveyor full - Delay in supplying at the supply part*[3] - The hoist at the upper end*[3]	---	---

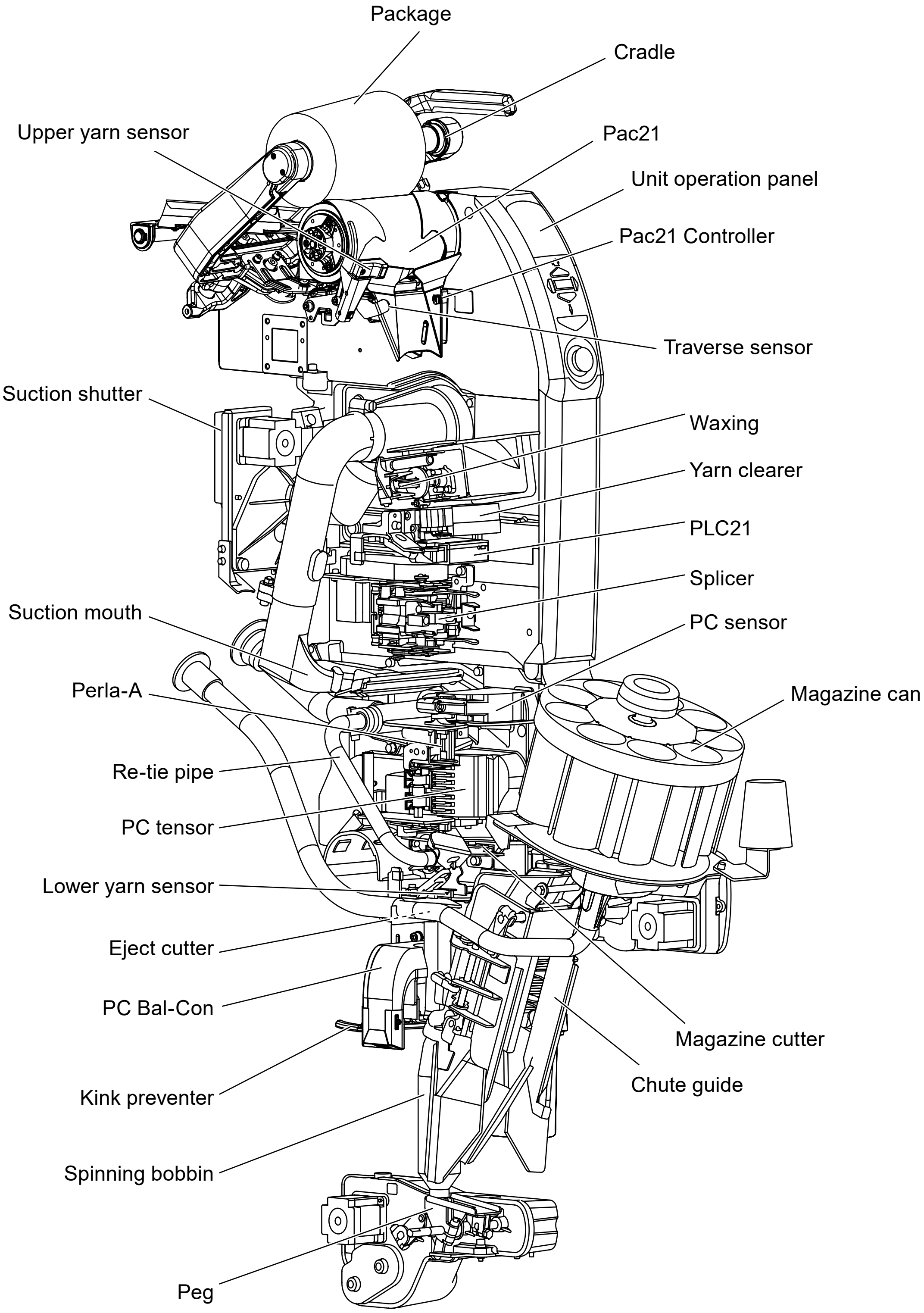
*[1] Red light flashes when more winding units than the number specified in the VOS setting “No. of winding units" require fixer call.

*[2] Yellow light flashes when more winding units than the number specified in the VOS setting “No. of winding units” require operator call.

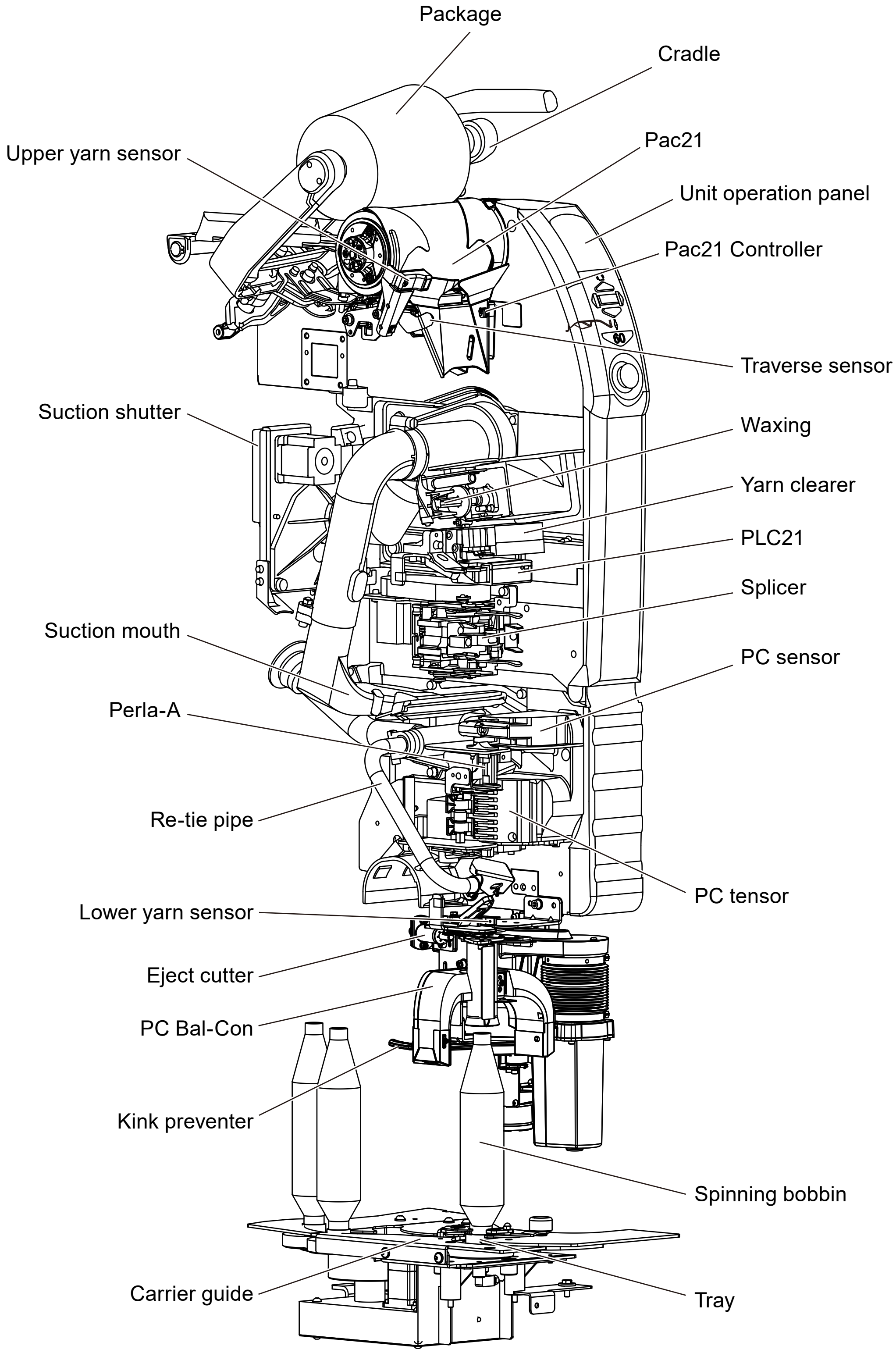
*[3] For details, refer to Chapter 8G (option).

2-4 Winding Unit Part Names

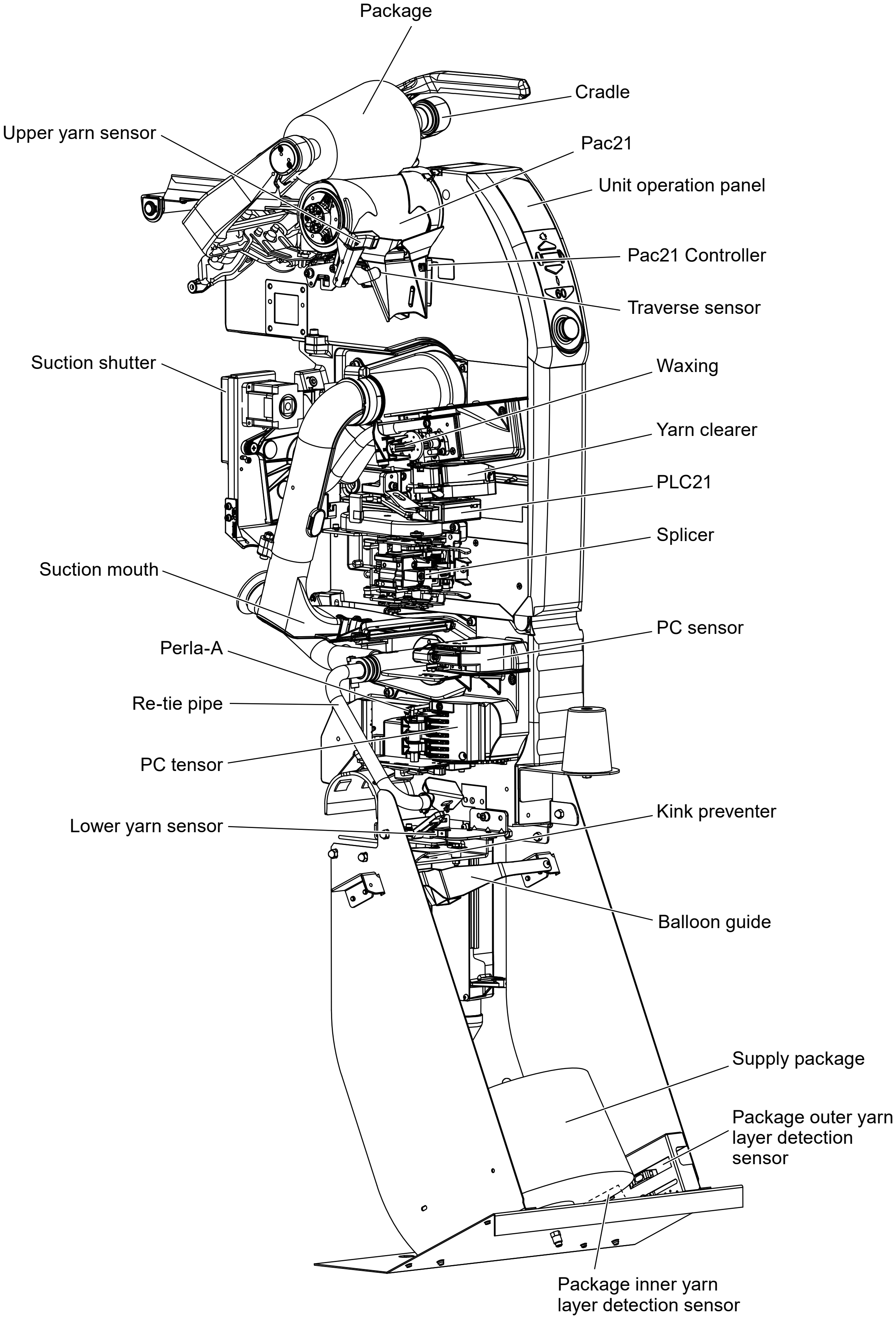
Straight Magazine


Package
Cradle
Upper yarn sensor
Pac21
Unit operation panel
Pac21 Controller
Traverse sensor
Suction shutter
Waxing
Yarn clearer
PLC21
Splicer
Suction mouth
PC sensor
Perla-A
Magazine can
Re-tie pipe
PC tensor
Lower yarn sensor
Eject cutter
PC Bal-Con
Magazine cutter
Chute guide
Kink preventer
Spinning bobbin
Peg

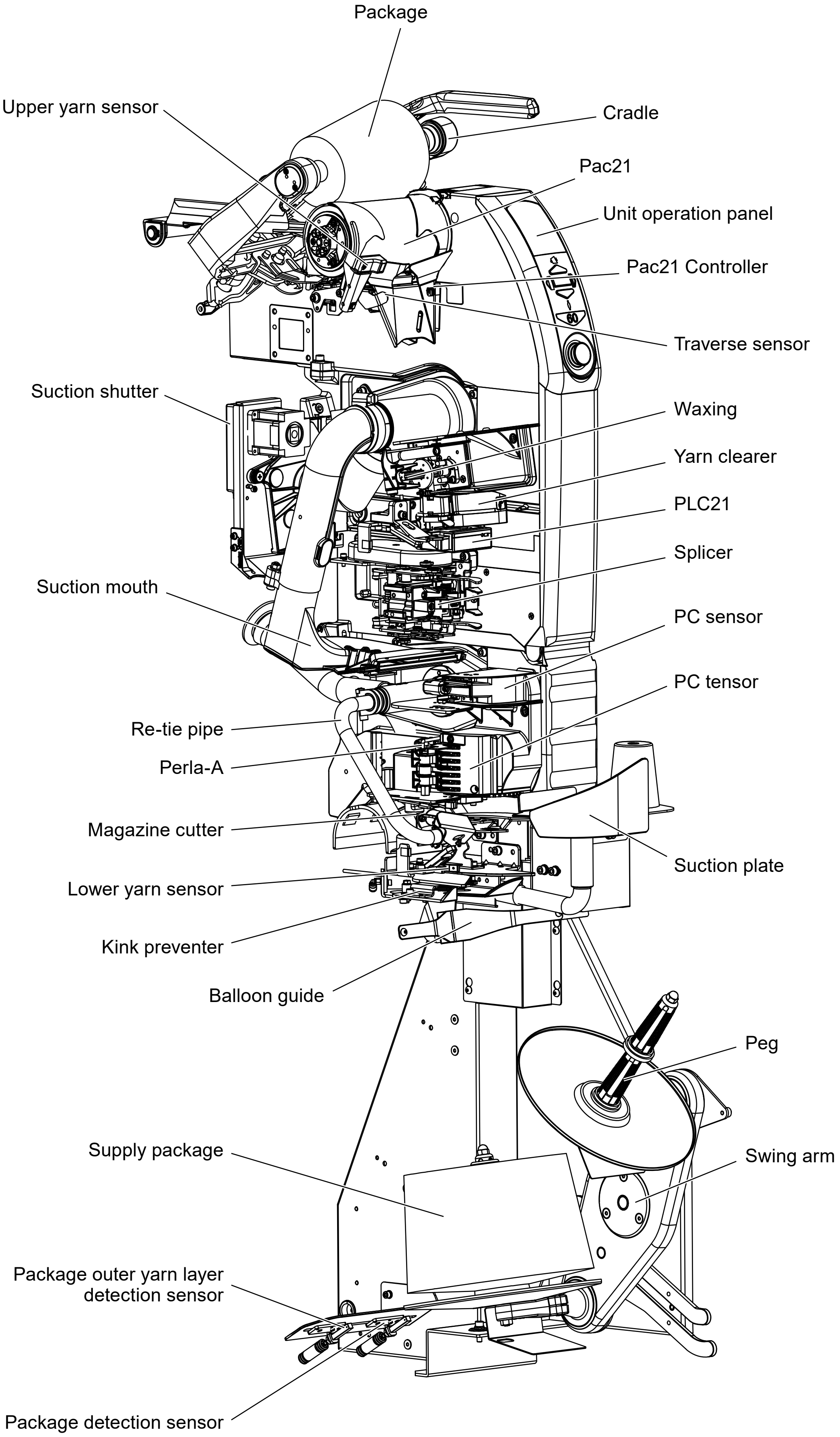
Bobbin Tray (Link Coner)


Package
Cradle
Upper yarn sensor
Pac21
Unit operation panel
Pac21 Controller
Traverse sensor
Suction shutter
Waxing
Yarn clearer
PLC21
Splicer
Suction mouth
PC sensor
Perla-A
Re-tie pipe
PC tensor
Lower yarn sensor
Eject cutter
PC Bal-Con
Kink preventer
Spinning bobbin
Carrier guide
Tray

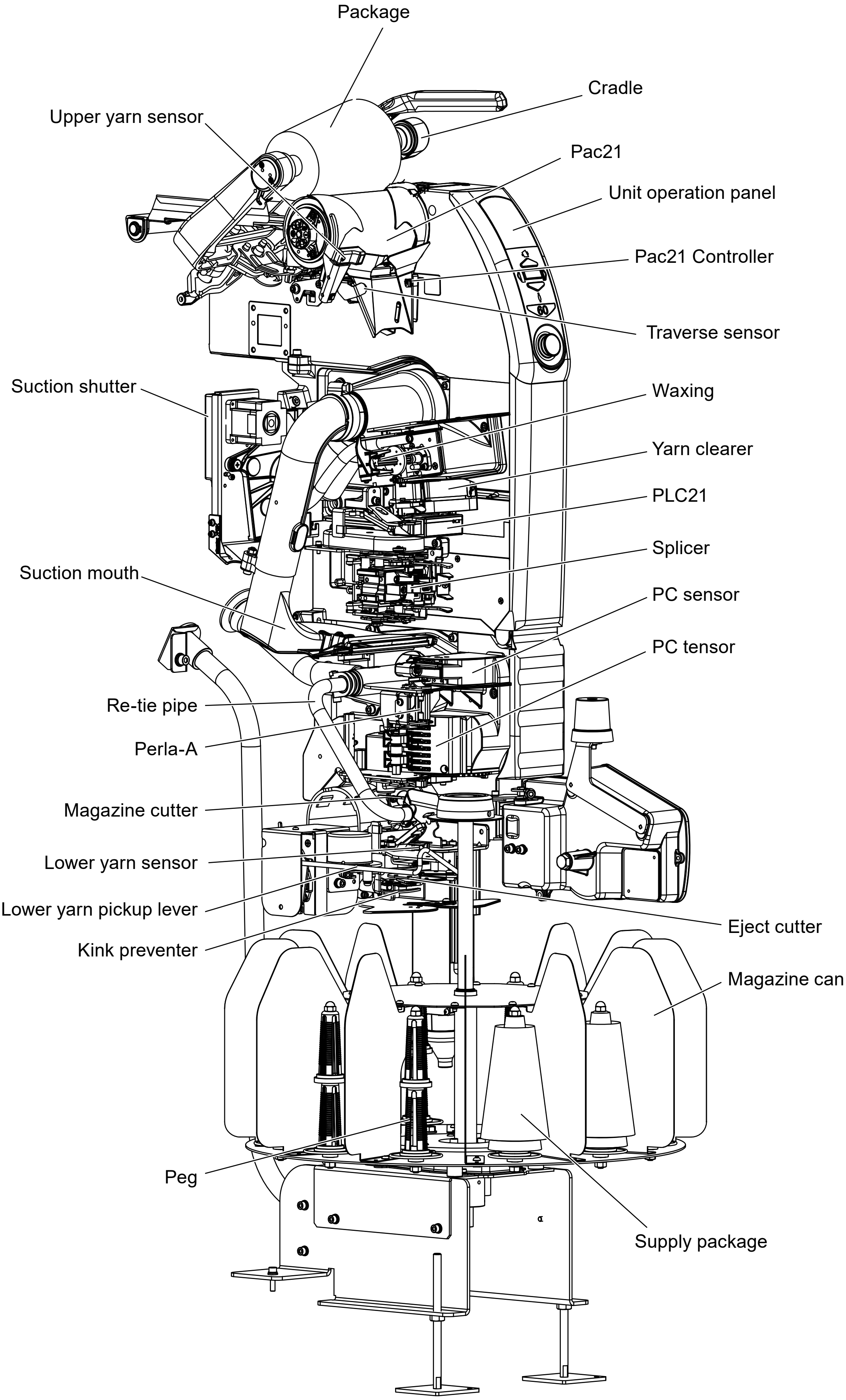
Cone to Cone Model-I


Package
Cradle
Upper yarn sensor
Pac21
Unit operation panel
Pac21 Controller
Traverse sensor
Suction shutter
Waxing
Yarn clearer
PLC21
Splicer
Suction mouth
PC sensor
Perla-A
Re-tie pipe
PC tensor
Lower yarn sensor
Kink preventer
Balloon guide
Supply package
Package outer yarn layer detection sensor
Package inner yarn layer detection sensor

Cone to Cone Model-II


Package
Upper yarn sensor
Cradle
Pac21
Unit operation panel
Pac21 Controller
Traverse sensor
Suction shutter
Waxing
Yarn clearer
PLC21
Splicer
Suction mouth
PC sensor
PC tensor
Re-tie pipe
Perla-A
Magazine cutter
Suction plate
Lower yarn sensor
Kink preventer
Balloon guide
Peg
Supply package
Swing arm
Package outer yarn layer
detection sensor
Package detection sensor

Rewind Magazine

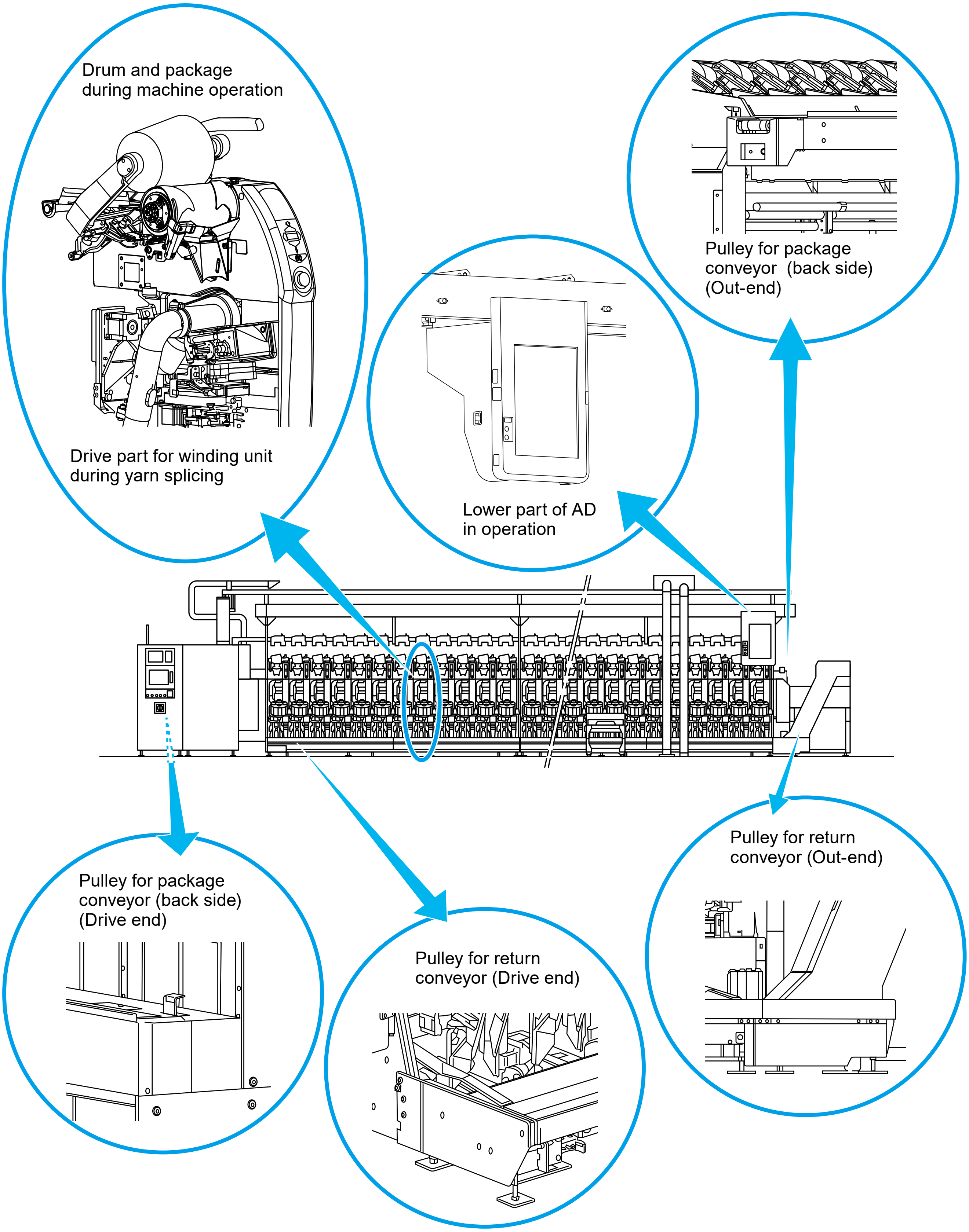

Package
Cradle
Upper yarn sensor
Pac21
Unit operation panel
Pac21 Controller
Traverse sensor
Suction shutter
Waxing
Yarn clearer
PLC21
Splicer
Suction mouth
PC sensor
PC tensor
Re-tie pipe
Perla-A
Magazine cutter
Lower yarn sensor
Lower yarn pickup lever
Eject cutter
Kink preventer
Magazine can
Peg
Supply package

Sec 3 Safety Precautions

3-1 Straight Magazine

WARNING

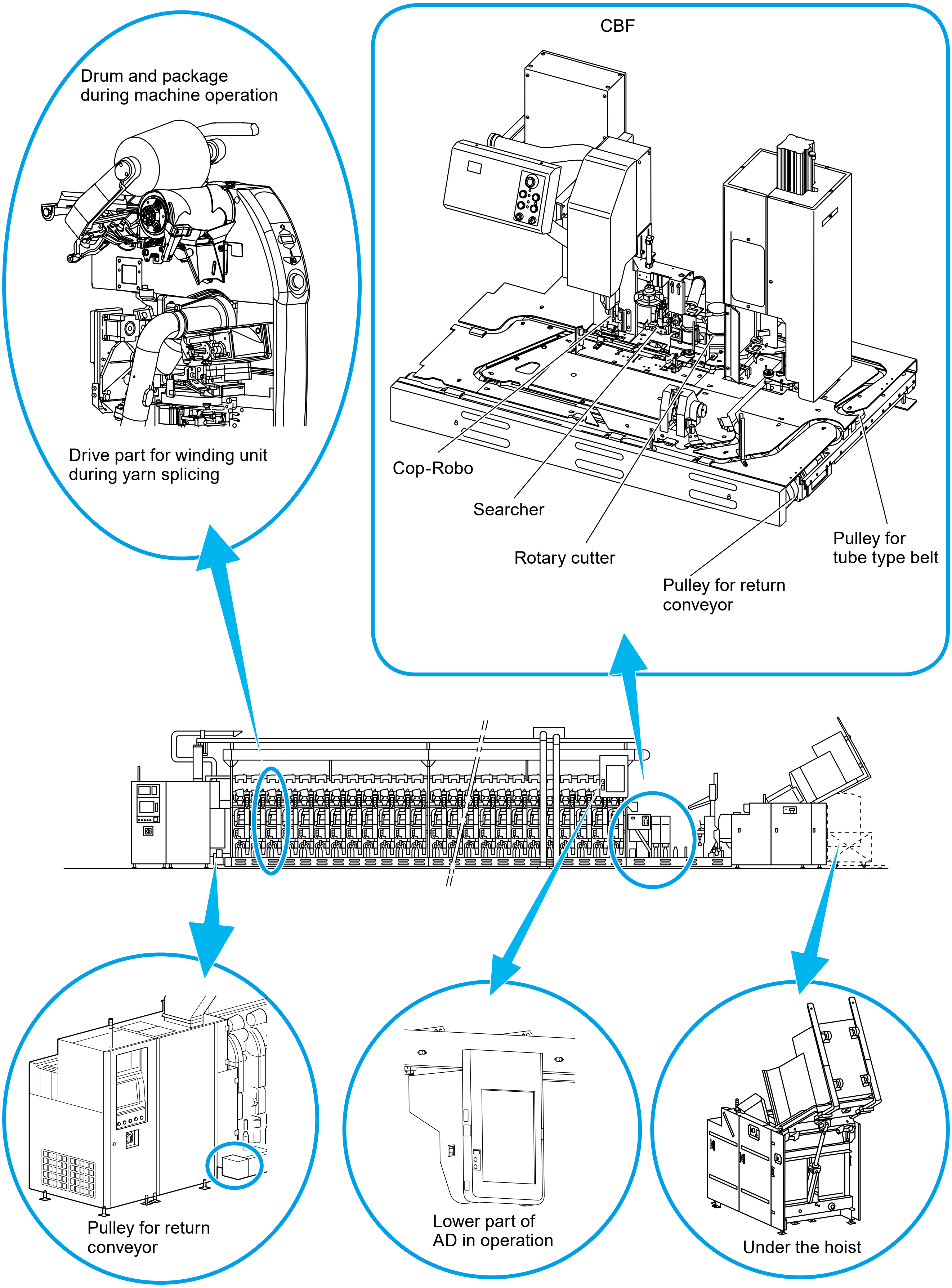
Operators should never touch any part of the drive section noted below while the machine is operating, as it is extremely dangerous.

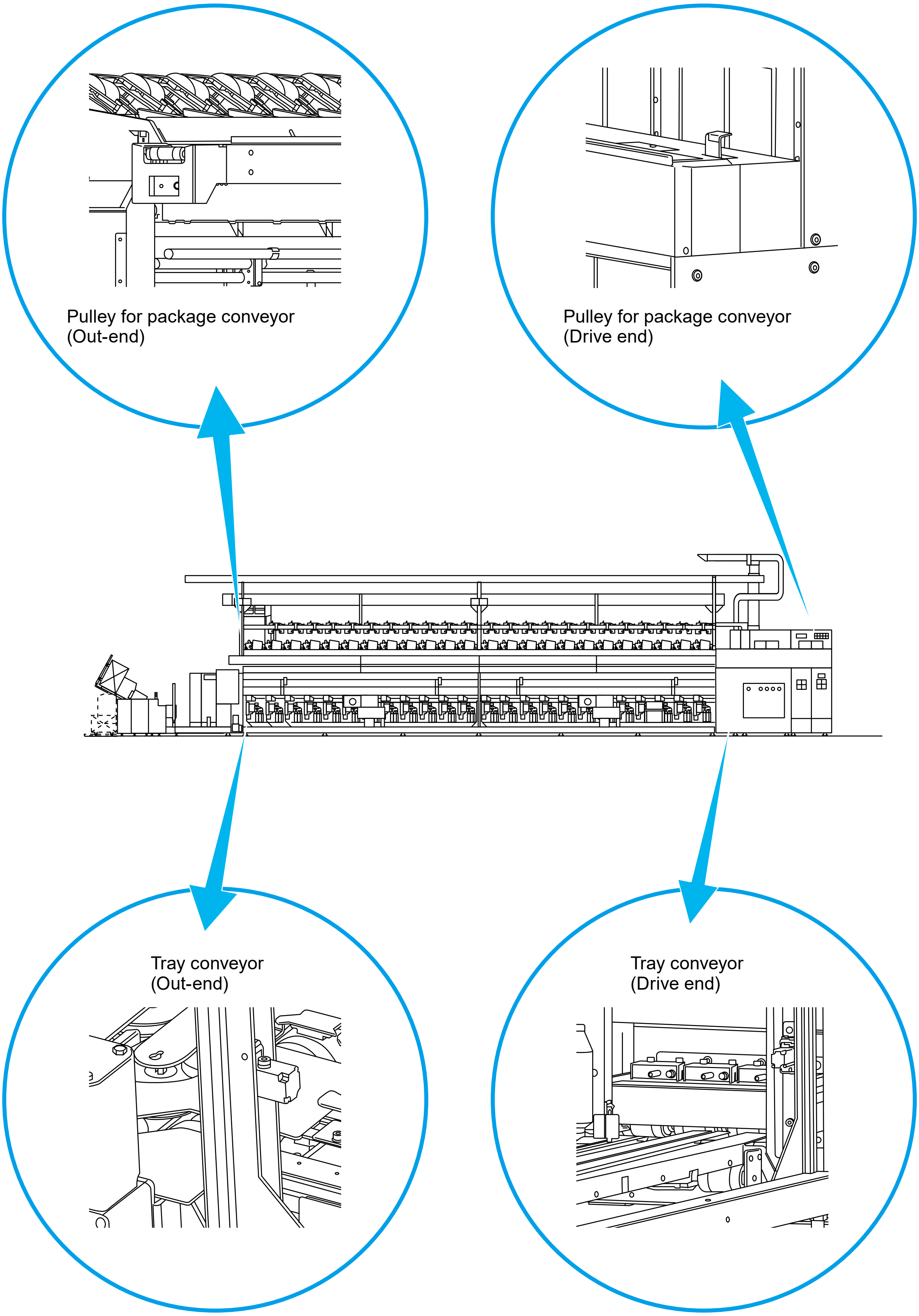

Drum and package
during machine operation
Drive part for winding unit
during yarn splicing
Lower part of AD
in operation
Pulley for package
conveyor (back side)
(Out-end)
Pulley for package
conveyor (back side)
(Drive end)
Pulley for return
conveyor (Drive end)
Pulley for return
conveyor (Out-end)

3-2 Bobbin Tray (Link Coner)

WARNING

Operators should never touch any part of the drive section noted below while the machine is operating, as it is extremely dangerous.

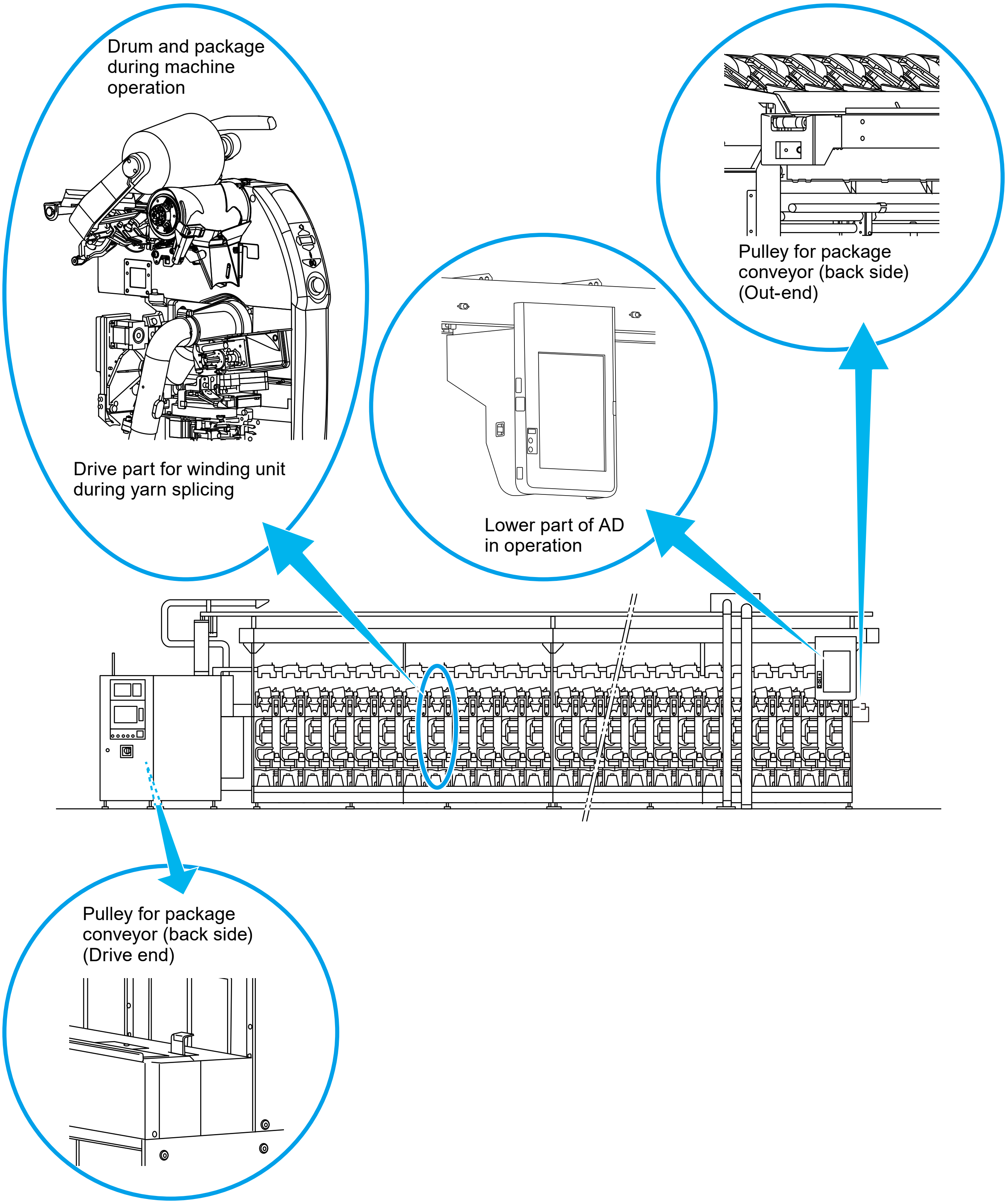

Drum and package during machine operation
Drive part for winding unit during yarn splicing
CBF
Cop-Robo
Searcher
Rotary cutter
Pulley for tube type belt
Pulley for return conveyor
Pulley for return conveyor
Lower part of AD in operation
Under the hoist


Pulley for package conveyor
(Out-end)
Pulley for package conveyor
(Drive end)
Tray conveyor
(Out-end)
Tray conveyor
(Drive end)

3-3 Cone to Cone Model-I

WARNING

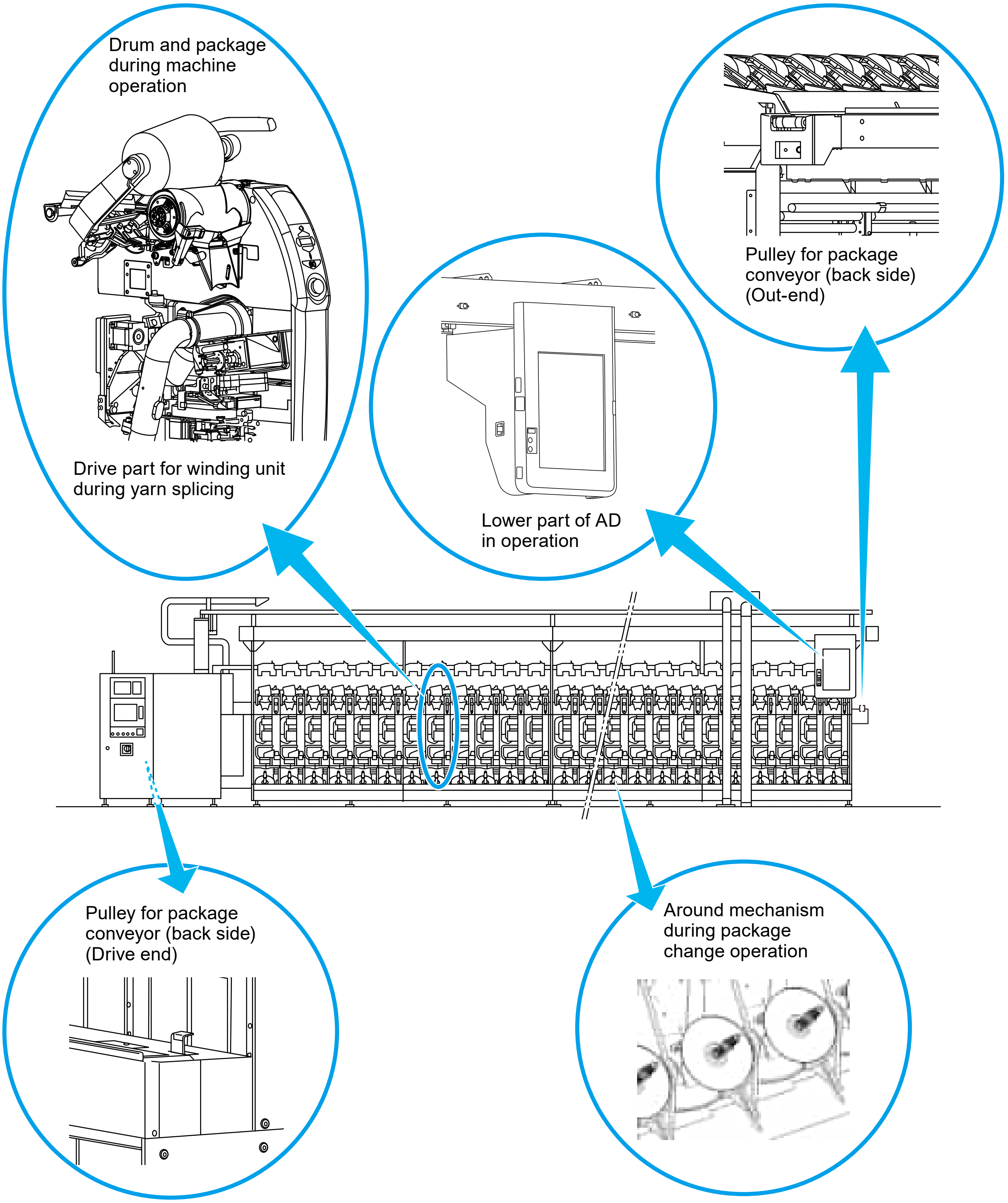
Operators should never touch any part of the drive section noted below while the machine is operating, as it is extremely dangerous.


Drum and package during machine operation
Drive part for winding unit during yarn splicing
Lower part of AD in operation
Pulley for package conveyor (back side) (Out-end)
Pulley for package conveyor (back side) (Drive end)

3-4 Cone to Cone Model-II

WARNING

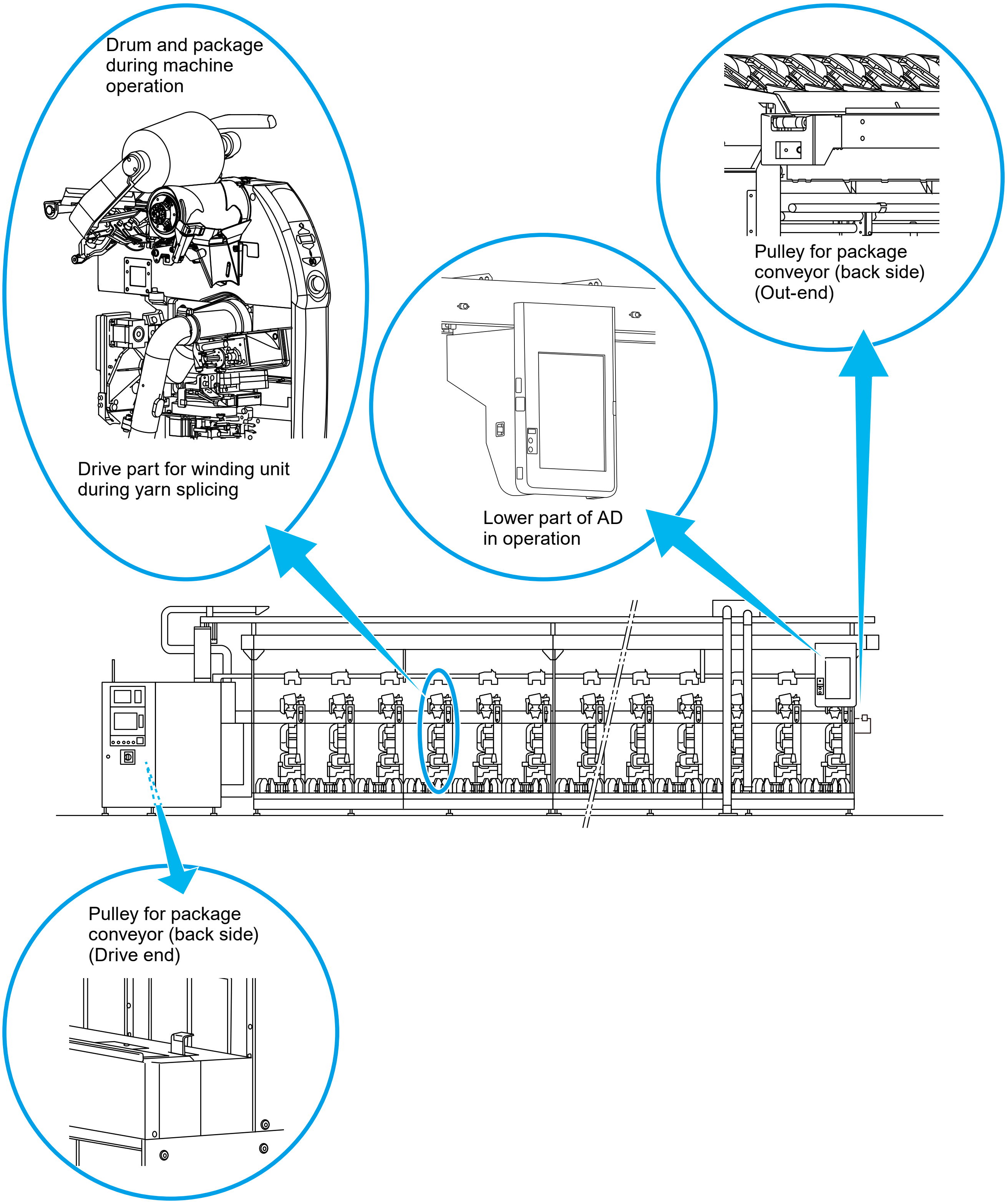
Operators should never touch any part of the drive section noted below while the machine is operating, as it is extremely dangerous.


Drum and package during machine operation
Drive part for winding unit during yarn splicing
Lower part of AD in operation
Pulley for package conveyor (back side) (Out-end)
Pulley for package conveyor (back side) (Drive end)
Around mechanism during package change operation

3-5 Rewind Magazine

WARNING

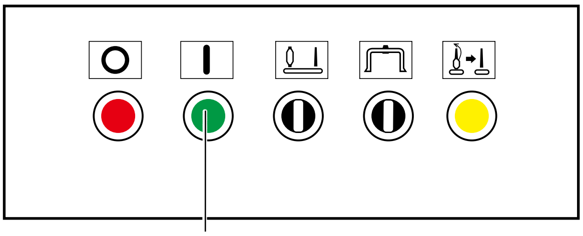
Operators should never touch any part of the drive section noted below while the machine is operating, as it is extremely dangerous.


Drum and package during machine operation
Drive part for winding unit during yarn splicing
Lower part of AD in operation
Pulley for package conveyor (back side) (Out-end)
Pulley for package conveyor (back side) (Drive end)

Sec 4 Starting Machine Operation

4-1 Starting Continuous Operation (Restarting after suspending operation/cleaning)

1. **Inspect the area around the machine to ensure safe operation.**
   The area behind the machine must be cleared of all personnel.
2. **Press the start button.**
   Automatic operation will begin about 30 seconds after the start button is pushed.



Start button

- **When the standby function* is OFF during machine startup**

Once the blower is enabled and the static pressure increases, the winding unit will begin automatic operation.

- **When the standby function is ON during machine startup**

The winding unit goes into standby mode*.
After pressing the start button again, the winding unit will begin automatic operation once the static pressure has increased.

* When the winding unit is started and the blower is enabled, the yarn threading operation is possible.

* Refer to the VOS in Chapter 7 “<12100> Basic Machine Settings,” for details on the standby function during machine startup.

* In the hot splicer specification, check if the nozzle temperature rises within one minute after the machine starts. (Refer to Chapter 4Hd)

4-2 Yarn Threading Standby

Machine Settings

1. **Turn ON the main switch.**
2. **Pressing the unit alarm reset button (middle) stops the winding unit temporarily.**
3. **On the VOS screen, set the winding conditions.**
4. **Set the yarn type, yarn count, and sensitivity level on the yarn clearer settings screen.**
   * Refer to the instruction manual for details on each one.

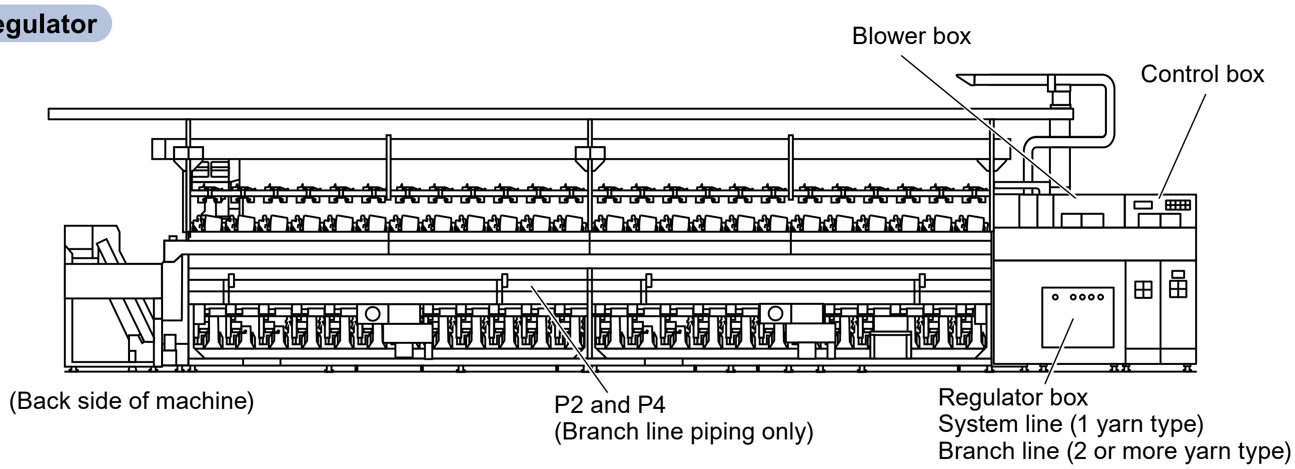
CAUTION

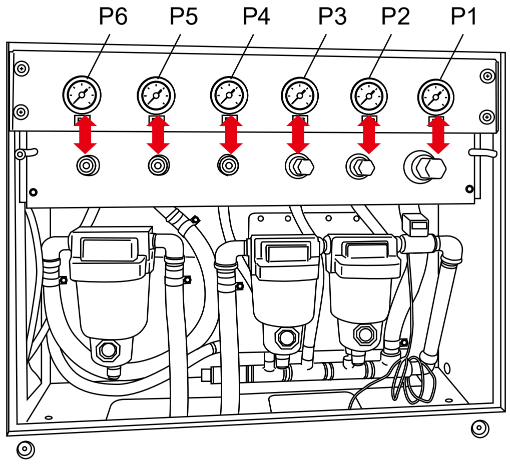
Before setting the sensitivity level, wait for more than 10 minutes after the main switch is turned ON.

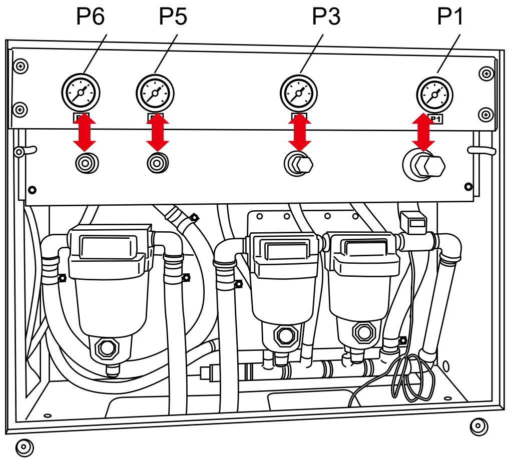
5. **Adjust the splicer air pressure using the P1 regulator and the P2 regulator.**
6. **Adjust the contact pressure using the P4 regulator.**
7. **Check the area around the machine to ensure safe operation.**
   Ensure that the area behind the machine is clear of all personnel (maintenance, etc.).
8. **Press the start button.**

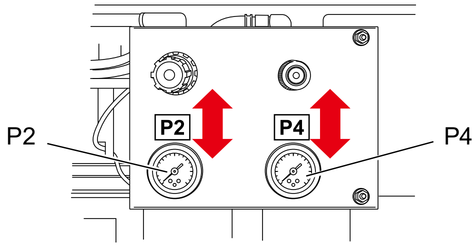
* Refer to the next page for the details on the regulator position.

Regulator


Blower box
Control box
(Back side of machine)
P2 and P4
(Branch line piping only)
Regulator box
System line (1 yarn type)
Branch line (2 or more yarn type)


P6
P5
P4
P3
P2
P1





Pipe type	Regulator quantity		Application	Pressure setting
	System line (1 yarn type)	Branch line (2 or more yarn type)		
P1	1 per machine	1 per machine	Splicer untwisting, Cleaning blast, Package conveyor, Dust collector, AD	Fixed: 0.65 MPa
P2		For each span	Splicer splicing	Setting range: 0.3 to 0.65 MPa * Adjustment depends on yarn type
P3		1 per machine	Contact pressure, Cradle lifter, Package brake, Bal-Con cutter, Magazine cutter, Blowing up	Fixed: 0.35 MPa
P4		For each span	Contact pressure adjustment	About 0.1 MPa * Adjustment depends on winding conditions
P5		1 per machine	Perla-A (option)	About 0.2 MPa * Adjustment depends on hairiness of yarn
P6		1 per machine	Take-up tube support	Fixed: 0.1 MPa

* For “1 per machine,” the regulator is behind the blower box, and “for each span,” the regulator is on the right side when looking at the span from the back.
* Refer to Chapter 4 for details on the setting values of each item.

4-3 Yarn Threading

Once the yarn threading standby is enabled, the yarn threading operation can be performed by the AD or by the operator.

Supplying the Spinning Bobbins (or the Supply Packages) to the Winding Units

1. **Supply the spinning bobbins (or the supply packages) to the winding units.**

   * The supply method may vary depending on the machine type.

Magazine	The operator supplies the spinning bobbins to the winding units
Bobbin Tray	The CBF automatically supplies the spinning bobbins to the winding units
Link Coner	The CBF automatically supplies the spinning bobbins to the winding units
Cone to Cone Model-I	The operator supplies the supply package to the pegs
Cone to Cone Model-II	The operator supplies the supply package to the pegs
Rewind Magazine	The operator supplies the supply package to the magazines

Yarn Threading Standby

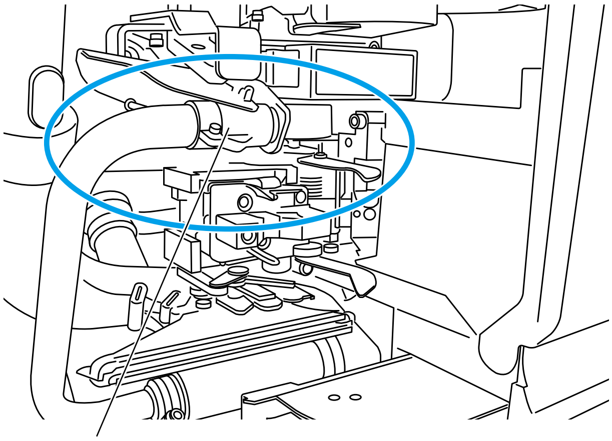
Before the threading operation is performed by the AD or by the operator, the yarn threading standby (re-tie pipe is raised) must be enabled on the machine.

1. **Ensure that the bobbin is set in place on the yarn supply part.**
   If the bobbin is not set in place, set it.
2. **Press and hold the alarm reset button (top) for more than 0.2 seconds while the machine is temporarily stopped.**
   Once the re-tie pipe picks up the lower yarn and temporarily stops in the top end position, the yarn threading standby mode is enabled.

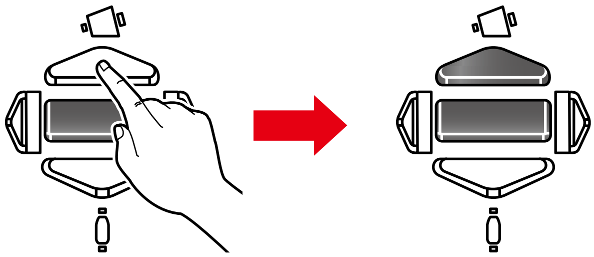
   * If the re-tie pipe fails to pick up the lower yarn, pressing the alarm reset button (top) again will lower the re-tie pipe again. When the re-tie pipe is lowered to the bottom position, press the alarm reset button (top) again.
   It is possible to repeat the re-tie pipe operation as many times as required by pressing the alarm reset button.

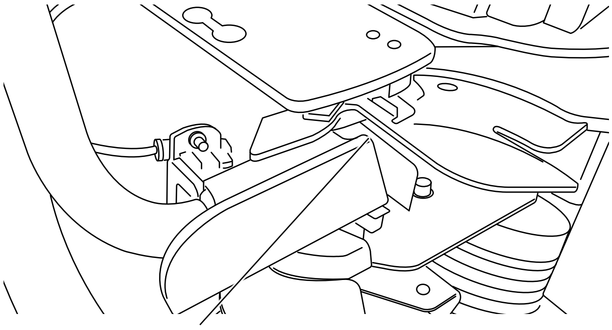
   * When there is no lower yarn, change the bobbin and perform the same operation.

   * If the alarm reset button (top) is pressed while the machine is still performing yarn threading standby operations, the re-tie pipe will lower and return to the temporary stop status.



Yarn threading standby
The re-tie pipe is temporarily stopped while in top end position

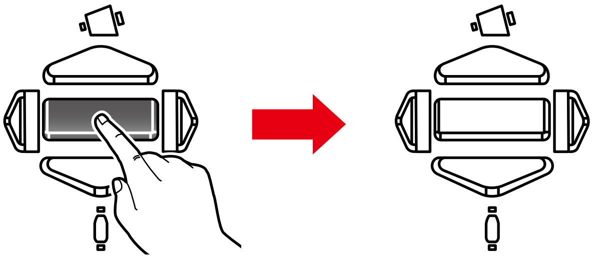




The re-tie pipe picks up lower yarn and is raised

AD Yarn Threading

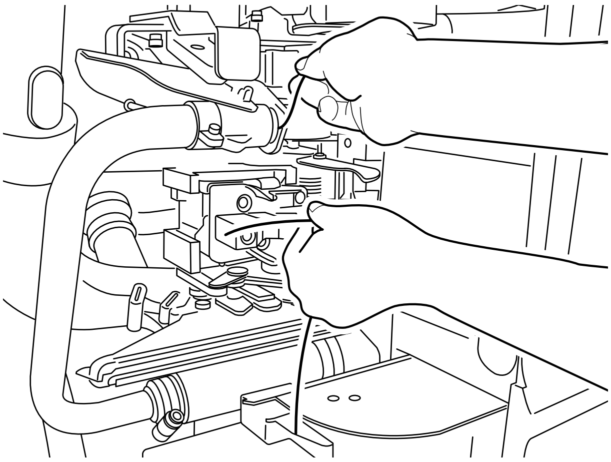
1. **Enable the yarn threading standby on the machine.**
2. **Press the alarm reset button (middle).**
   The operator call LED (blue) lights up and the AD goes into standby.
   The AD performs the yarn threading operation and automatically begins winding.



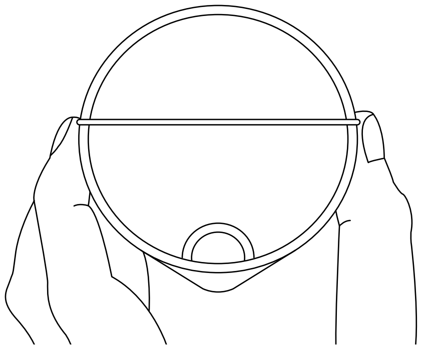
Operator Yarn Threading

1. **Enable the yarn threading standby on the machine.**

2. **Cut the yarn being sucked by the re-tie pipe with your right hand.**

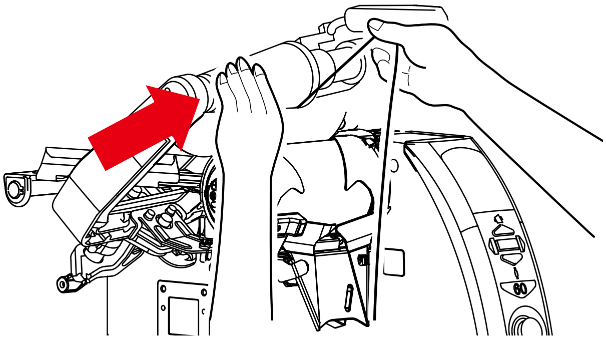


3. **Hold the take-up tube with your left hand and stretch the yarn across the bottom of the take-up tube.**
   Ensure that the yarn ends (tail end) protruding out of the take-up are as short as possible.



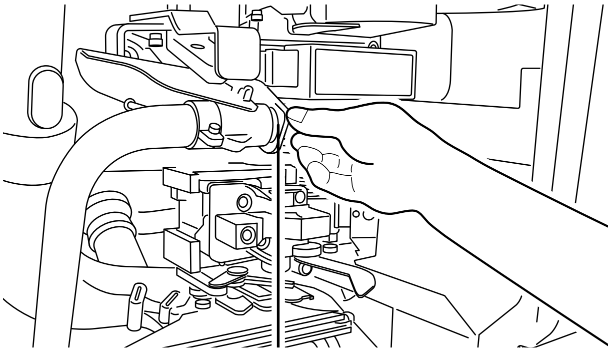
4. **Set up the take-up tube so that the yarn is located in between the take-up tube and the bearing center.**

5. **Put the yarn on the bunch guide and guide the yarn with your right hand so that it does not fall out of the bunch guide.**
   Then, perform the bunch winding operation by rotating the take-up tube with your left hand. (Wind the yarn five or six times)



6. **Ensure that the yarn is inside the yarn clearer slit.**
   * If it is not, insert the yarn into the slit by pushing it in with your hands.
   * It is essential to ensure that the yarn is inside the slit.

7. **Press the alarm reset button (middle).**
   The drum will rotate and start the winding operation.



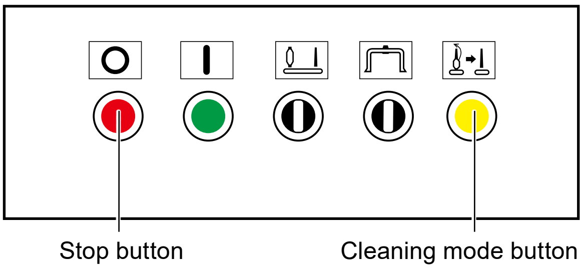
CAUTION

If the yarn is not in the slit in the yarn clearer as per step 6, the drum will not start rotating. In addition, the drum may not start rotating if it is left for a long time in yarn threading standby. If this happens, lower the re-tie pipe and perform the threading operation, starting from the temporary stop status again.

Sec 5 Stopping Machine Operation

Normal stop

This procedure is intended to bring the machine to a stop at the end of daily operation or before you take a break.



1. **Press the stop button.**
   When the standby function is OFF during a machine stoppage, the machine will stop.
   When the standby function is ON during a stoppage, the winding unit goes into standby mode*.
   Pressing the stop button again will stop the machine.

* Refer to the VOS in Chapter 7 “<12100> Basic Machine Settings,” for details on the standby function during a machine stoppage.

2. **Turn OFF the main switch when the operation has ended.**

Stopping the Machine for Cleaning

Press the cleaning mode button. The machine will stop after the ongoing winding operation for the spinning bobbin has been completed.
There is no need to press the stop button.

Emergency Stop

Refer to Chapter 1.

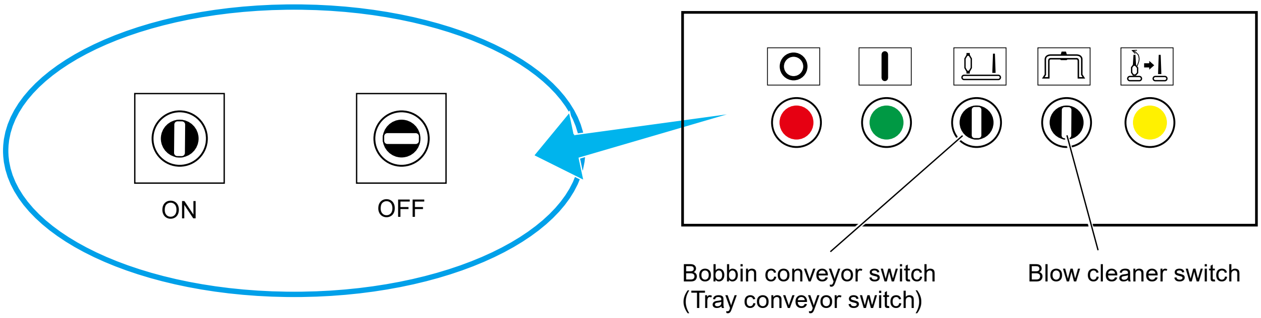
Stoppage Due to Power Failure

Refer to Chapter 1.

Stop to Replace Electrical Component

Refer to Chapter 3.

Sec 6 Starting/Stopping Each Device on Machine


ON
OFF
Bobbin conveyor switch
(Tray conveyor switch)
Blow cleaner switch

Bobbin Conveyor (Tray Conveyor) Switch Operations

* This conveyor is called a bobbin conveyor on Magazine and a tray conveyor on Bobbin Tray or Link Coner.

- **Turn off the bobbin conveyor switch to stop the bobbin conveyor.**
- **Turn on the bobbin conveyor switch to restart the bobbin conveyor.**

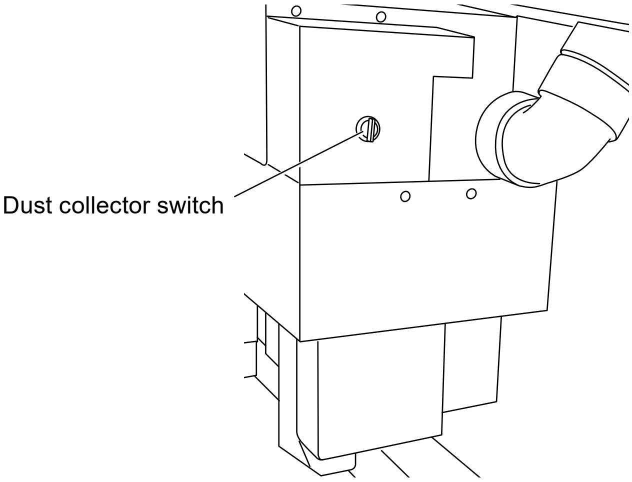
Blow Cleaner Switch Operations

- **Turn off the blow cleaner switch to stop the blow cleaner.**
- **Turn on the blow cleaner switch to restart the blow cleaner.**

Dust Collector Switch Operations

- **Turn off the dust collector switch to stop the dust collector.**
  All dust collectors on each span are disabled.

- **Turn on the dust collector switch to restart the dust collector.**
  All dust collectors on each span are enabled.


Dust collector switch

Sec 7 Stoppage During Winding Unit Operation

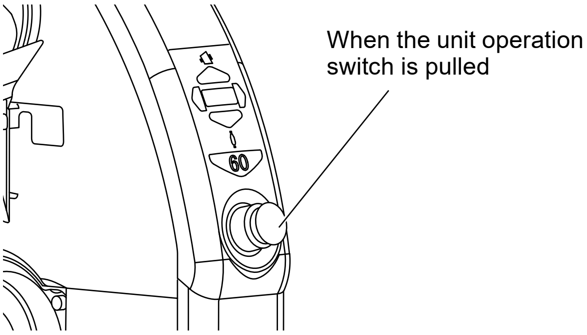
Listed below are three ways to stop the winding unit during operation.

Stopping Operation

- **When the unit operation switch is pulled**

This stopping method is used to bring the winding unit to a full stop for a set period of time, such as during maintenance.

* When the unit operation switch is pulled, rotate it to the left to lock it in place. This safety feature prevents the machine from being turned ON even if the switch is pressed accidentally.



- **Resetting method**

Rotate the unit operation switch to the right to release the lock and push it in.

Temporary Stop

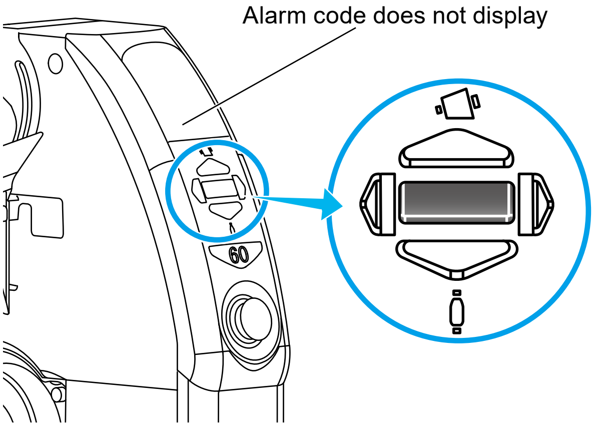
- **When there is no display on the winding unit indicator and the alarm LED (middle) is lit**

This stoppage is achieved by pressing the alarm reset button (middle) either while the power is turned on or while the unit is still in operation.

- **Resetting method**

Press the alarm reset button (middle).

* When performing a temporary stop operation due to an alarm stoppage, press the alarm reset button (middle) within 1 second of resetting the alarm.



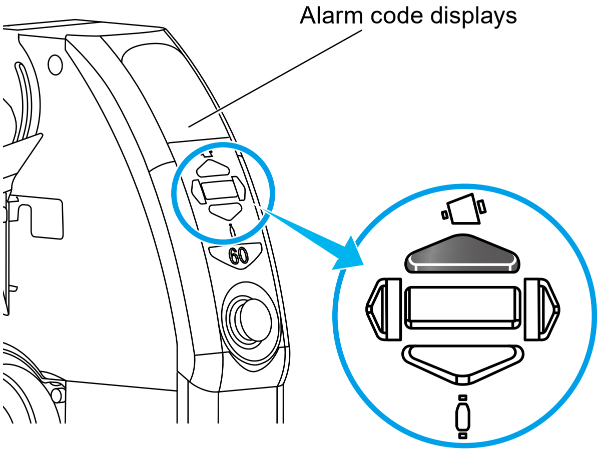
Alarm Stop

- **When an alarm code is displayed on the winding unit indicator, the alarm LED (either the top, middle or bottom) is lit**

This stoppage occurs due to an alarm.

- **Resetting method**

Press the alarm reset button that is lit.

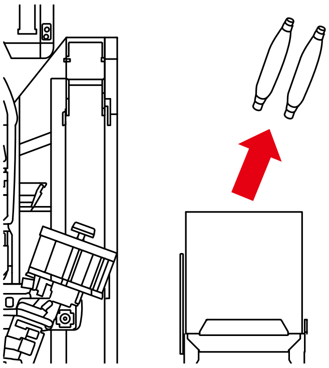


Sec 8 Controlling the Winding Unit During Operation

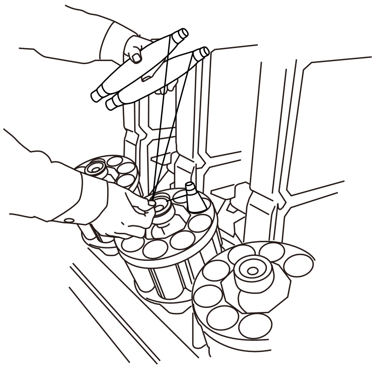
8-1 Supplying Spinning Bobbins or Supply Packages

Supplying spinning bobbins to the magazine (Straight Magazine)

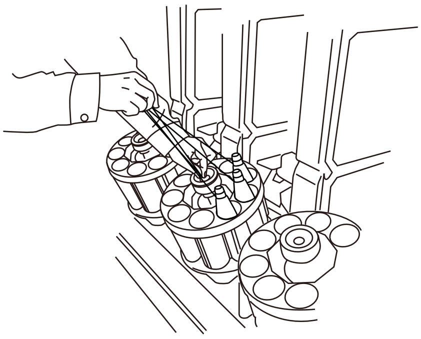
1. **Remove two spinning bobbins from the bobbin box.**



2. **Pull out the yarn ends.**
   * Completely remove the bottom winding and back winding.



3. **Insert the bobbins into the magazine.**
   * Allow more than 40 cm of the end of the yarn to be sucked in.

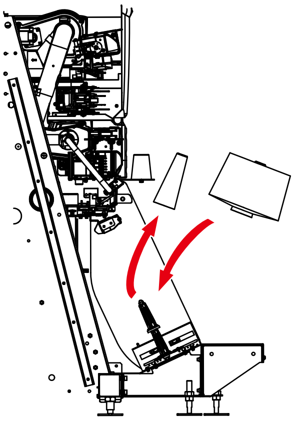


4. **Perform this operation (supplying the two bobbins) at each winding unit in order.**
   * Under normal conditions, the magazine does not require eight spinning bobbins to be supplied at once.

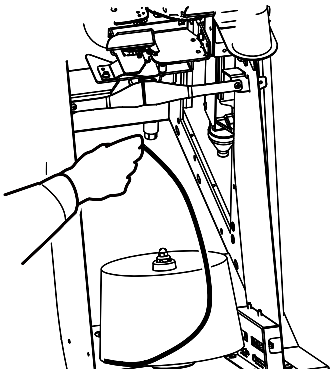
Supplying supply packages to the peg (Cone to Cone Model-I)

1. **If there is no more yarn on the supply tube on the peg, then insert a new supply package.**

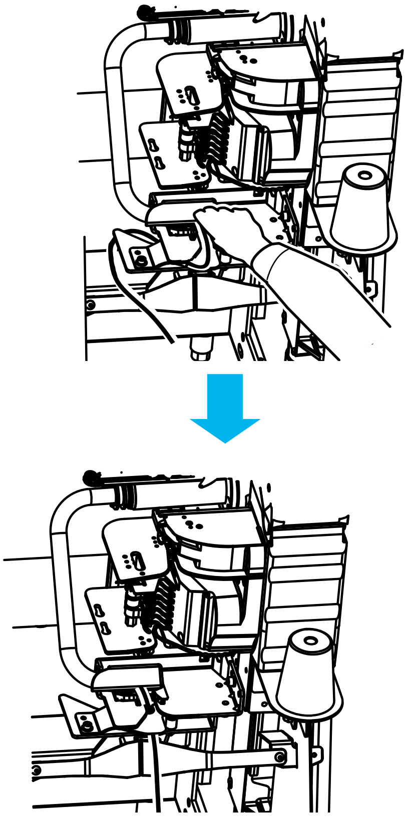
   * If the bunch winding has come off, remove it.



2. **Pull out the yarn ends.**

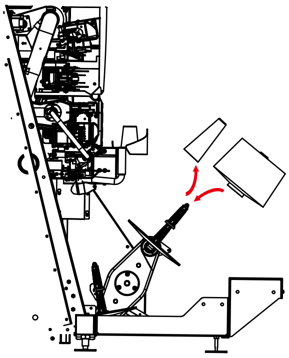


3. **Run the yarn behind the back side of the guide plate, and then draw it through to the re-tie pipe.**

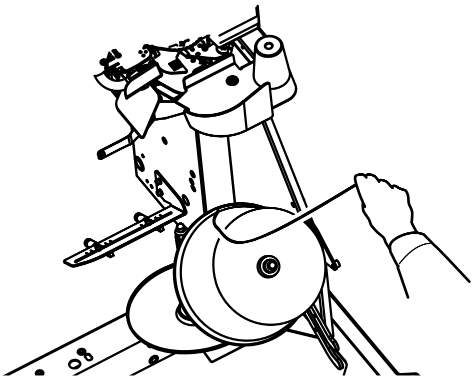


Supplying supply packages to the peg (Cone to Cone Model-II)

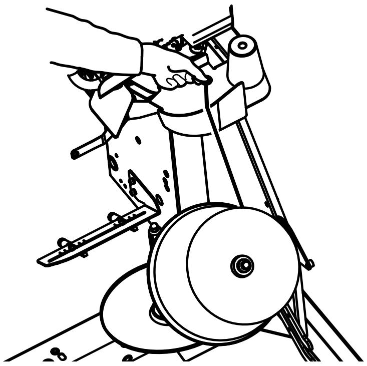
1. **If there is no more yarn on the supply tube on the peg, then insert a new supply package.**
   * If the bunch winding has come off, remove it.



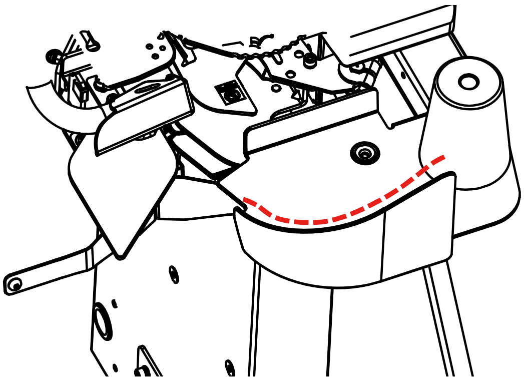
2. **Pull out the yarn ends.**



3. **Insert the yarn into the suction plate.**
   * Allow more than 40 cm of the end of the yarn to be sucked in.

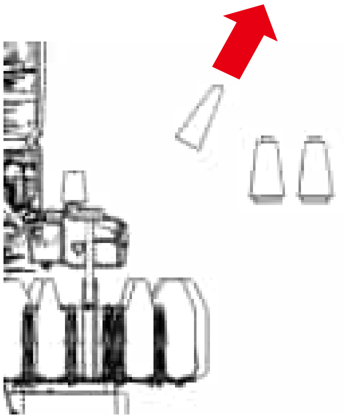


* Insert the yarn so that it runs down the slope on the suction plate. (Dotted line in right figure)



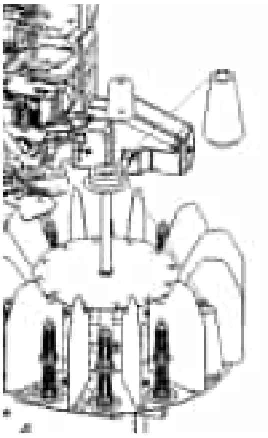
Supplying supply packages to the magazine (Rewind Magazine)

1. **If there is no more yarn on the supply tube on the peg, then prepare a new supply package.**



2. **Pull out the yarn ends.**

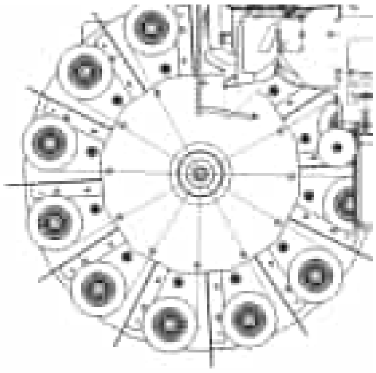
   * If the bunch winding has come off, remove it.



3. **Insert the yarns into the magazine.**

   * Allow more than 40 cm of the end of the yarn to be sucked in.
   In addition, set up so that the adjacent yarn does not double up when drawn to the magazine can head.
   Do not mix up P winding and Q winding.

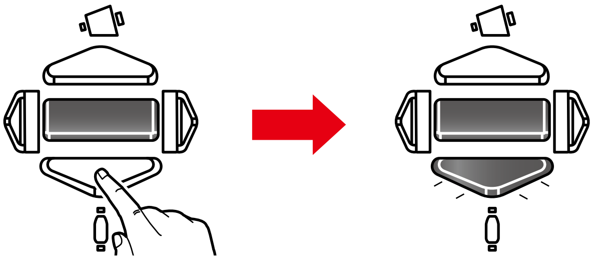
   * Refer to 4Ua section for P winding and Q winding specifications.



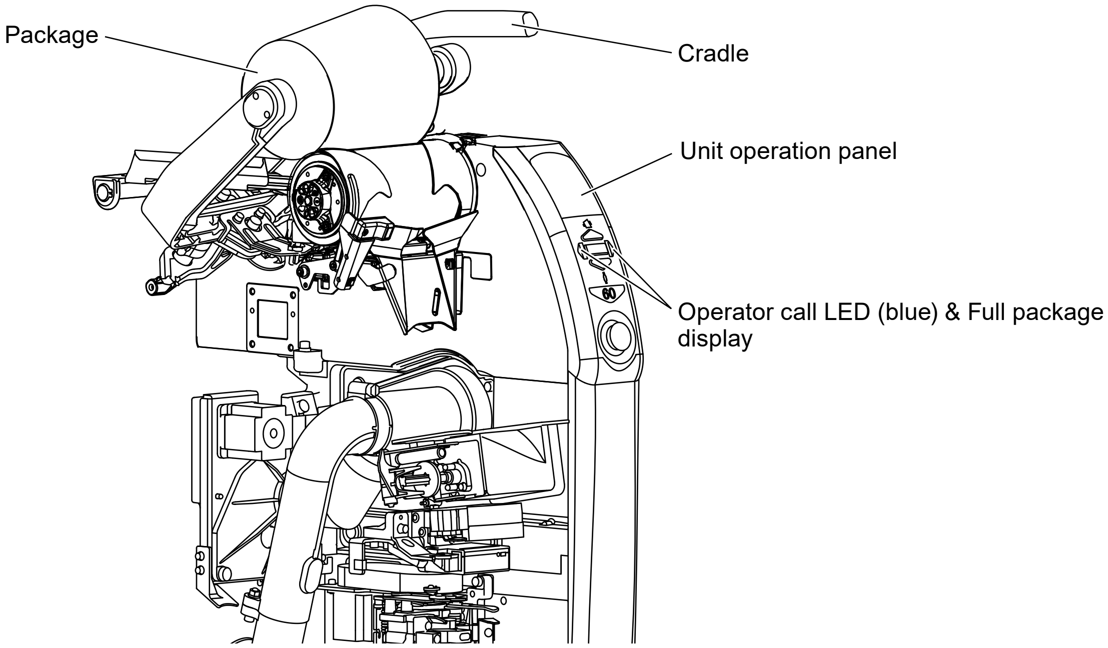
4. **Perform this operation supplying the supply package at each winding unit in order.**

   * Under normal conditions, each magazine does not require all the supply packages to be supplied at once.

   * When unlocking the rotation lock on the magazine can, stop the unit and then press and hold the alarm reset button (bottom). Release the button when it begins to flash. The magazine can rotation lock will unlock and become free (approximately 20 seconds).



8-2 Doffing & Yarn Threading



When Equipped with an AD

1. **The operator call LED (blue) lights up and the AD for the winding unit goes into standby mode.**
   The AD automatically performs the doffing and yarn threading operation.

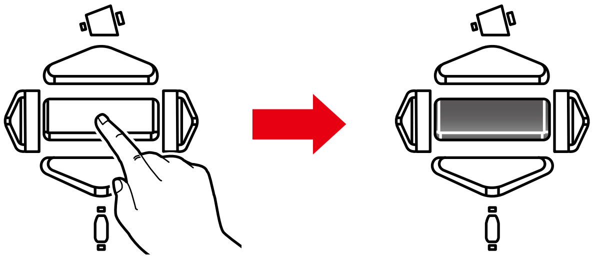
   * Whenever the yarn threading operation is performed, the winding unit yarn length counter is automatically reset.

When Not Equipped with an AD

The operator call LED (blue) lights up and the winding unit goes into standby mode for doffing.
The operator must follow the procedure below to perform the doffing and yarn threading operation.

* Whenever the yarn threading operation is performed, the winding unit yarn length counter is automatically reset.

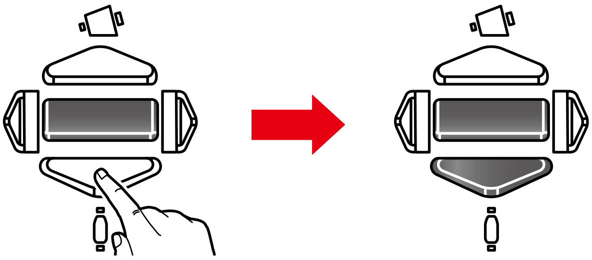
1. **Raise the cradle and roll the full package toward the back of the winding unit.**
2. **Press the alarm reset button (middle).**
   The yarn threading standby mode is enabled on the machine.
3. **Perform yarn threading operation. (Refer to Chapter 2)**

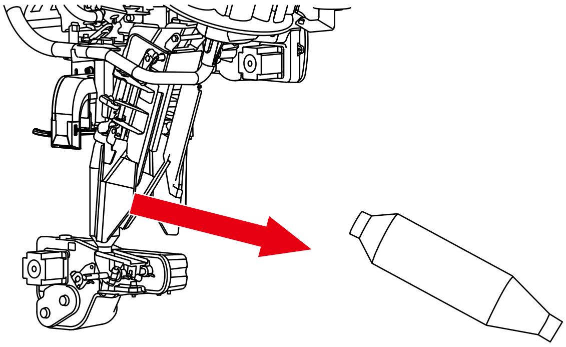


8-3 Forced Bobbin Ejection

You can manually force the supply yarn bobbin to eject.

1. **Press the alarm reset button (bottom) while the machine is temporarily stopped.**



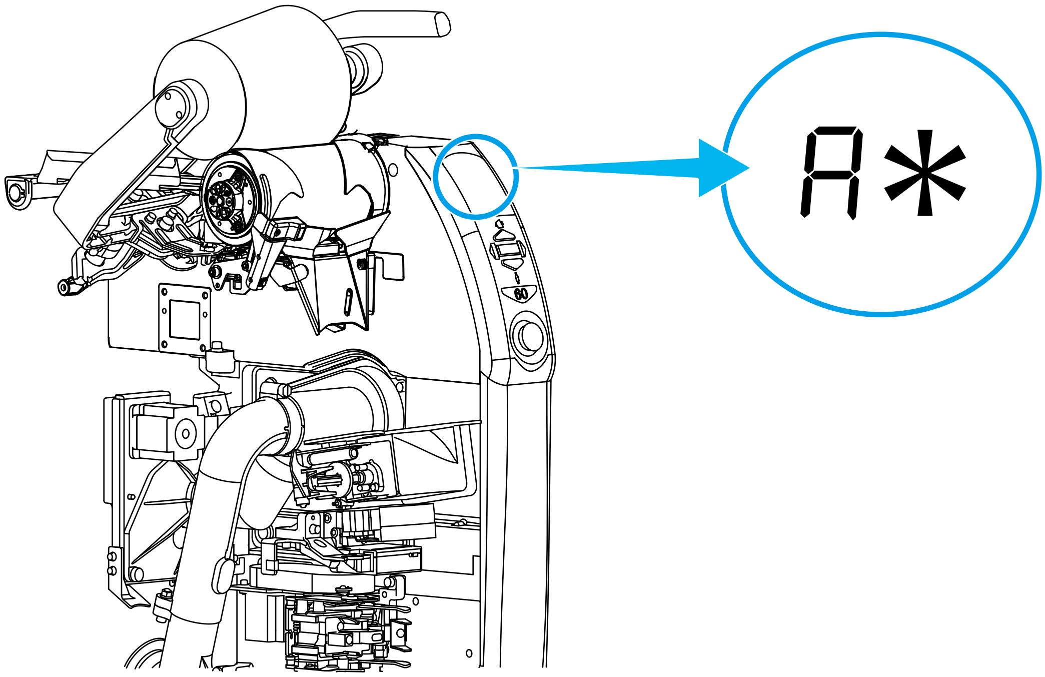


Ejecting the supply bobbin (or supply package) stops the winding unit temporarily.

* Except Cone to Cone

8-4 Resetting Method After a Yarn Threading Error

When an AD error has occurred, the winding unit indicator displays “A*.”



1. **Remove the take-up tube that has fallen or that is stuck to the cradle.**
2. **Press the alarm reset button (middle) to reset.**
   The AD automatically travels to perform the yarn threading operation.

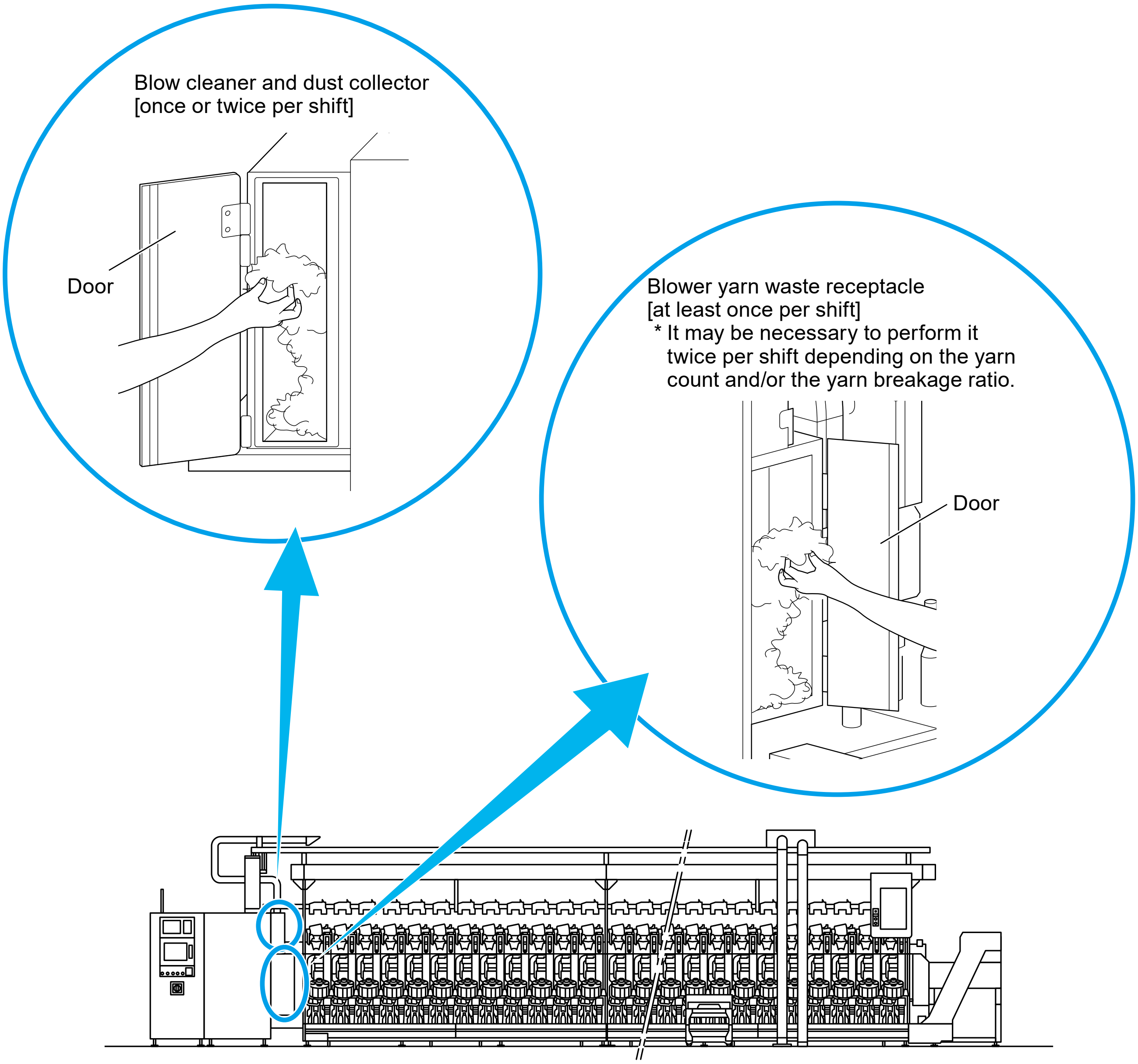
Sec 9 Yarn Waste Removal

Remove any yarn waste from the blower and the blow cleaner at regular intervals.

CAUTION To avoid accidents, be sure to bring the winding unit to a stop by pushing the stop button beforehand.

WARNING **Damaged filter must be repaired or changed immediately. Using a damaged filter may result in a fire.**

WARNING **Restart only after making sure the door is shut. Restarting while the door is open is extremely dangerous and can also lead to the door being damaged.**

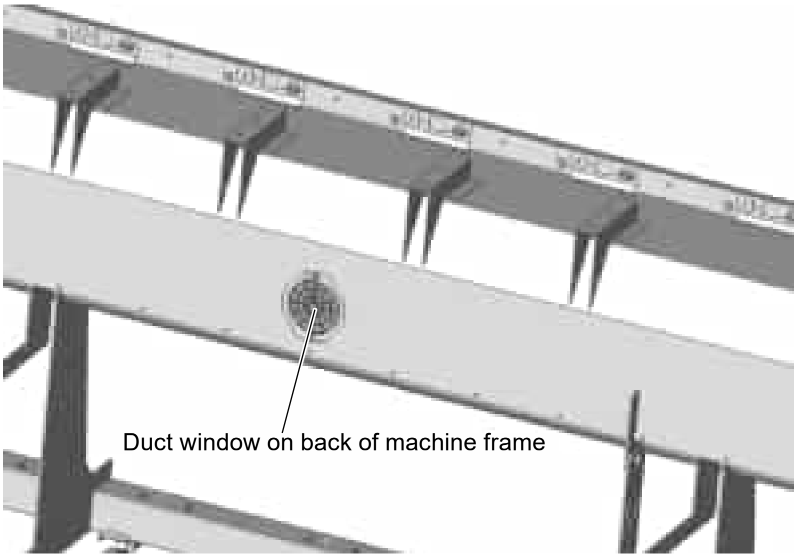

Blow cleaner and dust collector
[once or twice per shift]
Door
Blower yarn waste receptacle
[at least once per shift]
* It may be necessary to perform it twice per shift depending on the yarn count and/or the yarn breakage ratio.
Door

If there is yarn waste remaining in the main duct (residual yarn waste)

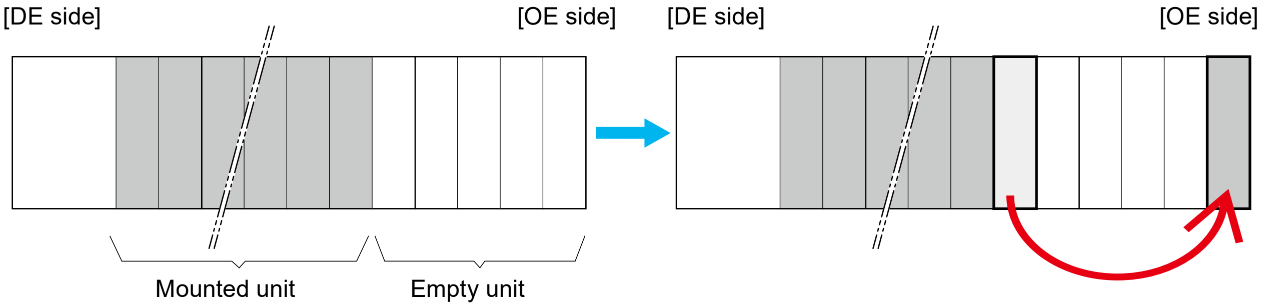
If there is residual yarn waste in the main duct, remove it via the duct window in the back of the machine frame.

CAUTION

To avoid accidents, be sure to bring the winding unit to a stop by pushing the stop button beforehand.


Duct window on back of machine frame

In addition, for Link Coner, if there are multiple empty units (unmounted winding units) in the out-end section, large amounts of yarn waste may build up in the out-end section ducts. In such cases, placing even 1 of the mounted winding units on the out-end, it will create airflow in the duct which will make it easier for the yarn to flow.


[DE side]
[OE side]
Mounted unit
Empty unit
[DE side]
[OE side]

Sec 10 Cleaning

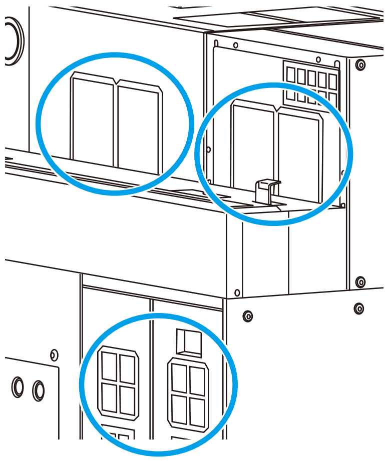
Clean the following spots of the machine in operation at regular intervals.

Cleaning the back of the machine

CAUTION

To avoid accidents, be sure to bring the winding unit to a stop by pushing the stop button beforehand.

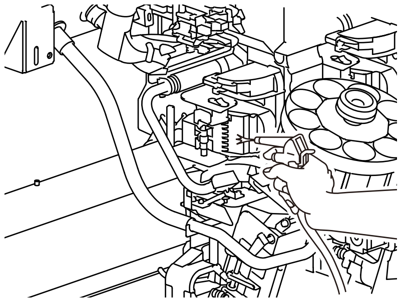
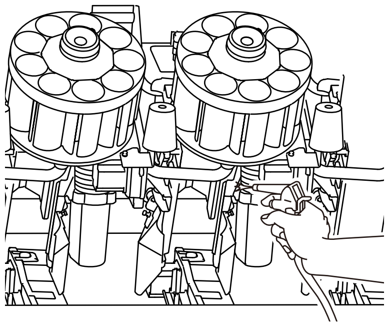
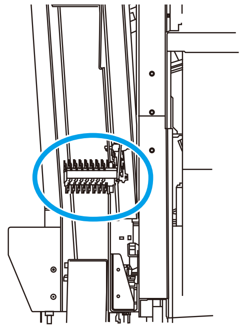
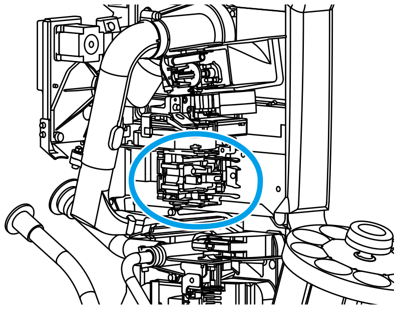
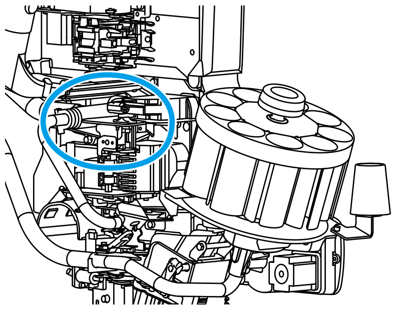
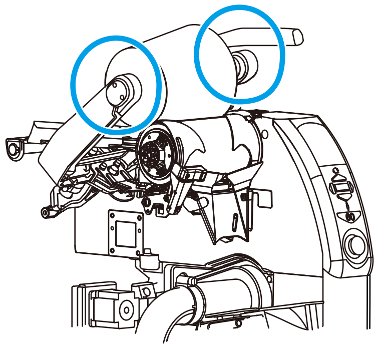
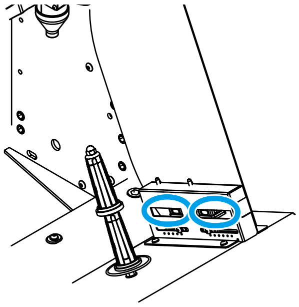
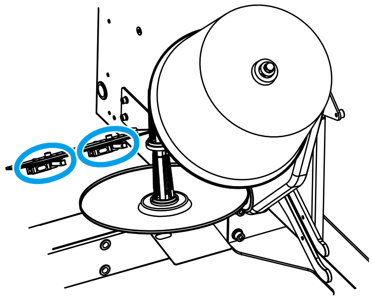
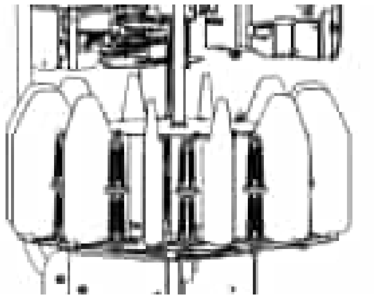
Blower motor filter [Once a day]



Unit cleaning

CAUTION

To avoid accidents, be sure to bring the winding unit to a stop by pushing the stop button beforehand.

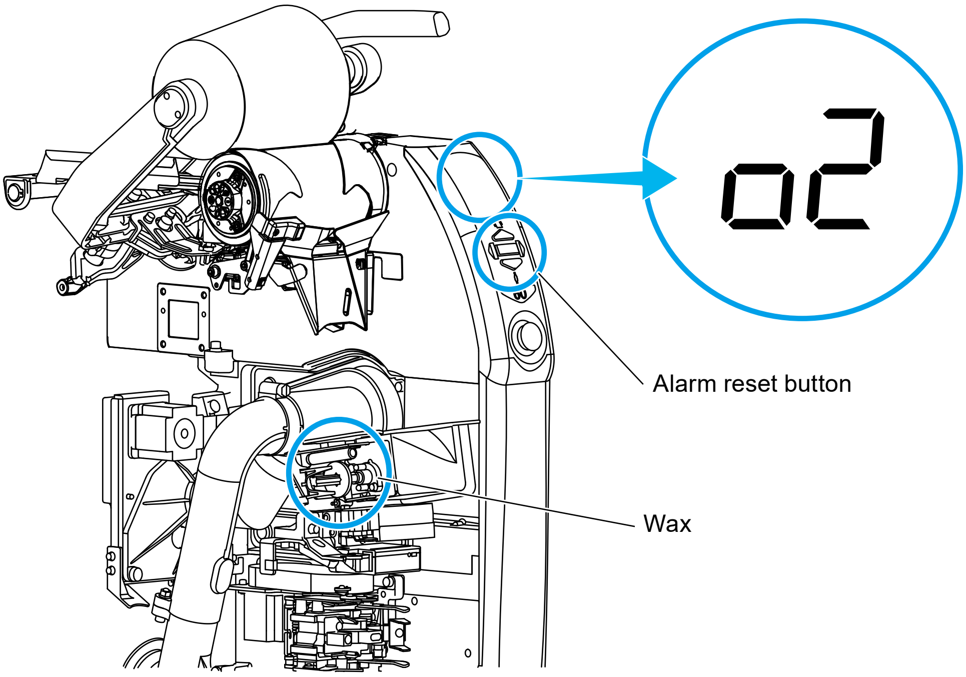
Tensor box [Once a day]	**Peg (Magazine only) [Once a day]**	**Bobbin conveyor brush (Magazine only) [Once a day]**
		
Splicer [Once a day] Water splicer [Once per shift] Hot splicer [Once a day]	**Perla-A [Once a day]**	**Bearing center (R side/L side) [As necessary]**
		
Package detection sensor (Cone to Cone Model-I only) [Once a day]	**Package detection sensor (Cone to Cone Model-II only) [Once a day]**	**Magazine for rewind magazine [Once a day]**
		

Sec 11 Wax Replacement

11-1 Wax Replacement Notification

If the low wax detection is set to ON in the VOS settings, “o2” will be displayed on the winding unit indicator and the alarm LED (middle) will flash when it is necessary to replace the wax.

* The alarm stops once the set time for the low wax alarm is exceeded.

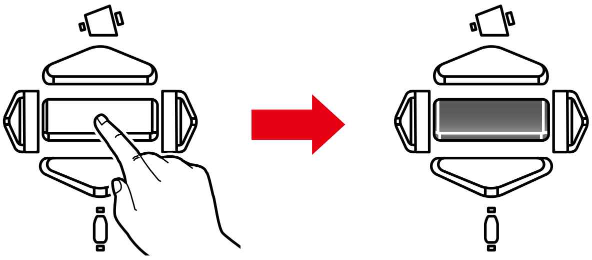


11-2 Replacement Method

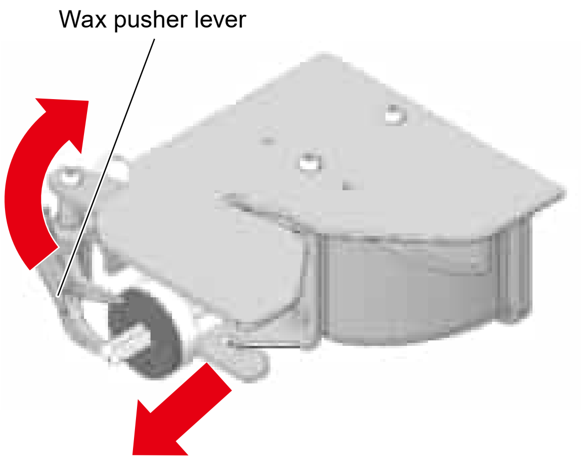
1. **Press the alarm reset button (middle) to stop the winding unit.**

   * This operation is unnecessary when the winding unit has already stopped due to an alarm stoppage.

   CAUTION Always stop the alarm first before replacing the wax.

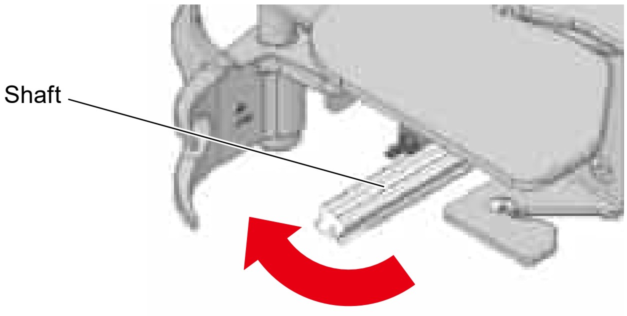


2. **Hold the wax pusher lever open and then remove the wax from the wax shaft as shown by the direction of the arrow.**



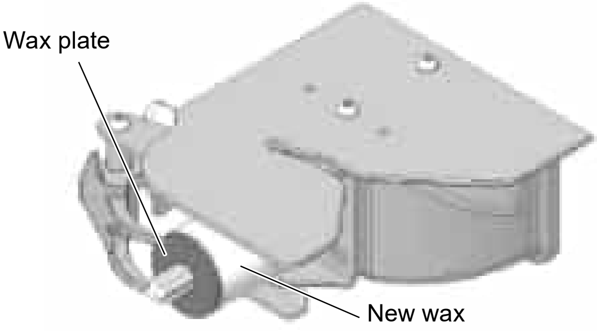
* When re-inserting the shaft, push it in all the way so that the hook catches on the shaft. Then, rotate the wax shaft as shown by the direction of the arrow and fix it in place.

CAUTION Pull on the shaft to ensure that it is caught on the hook.



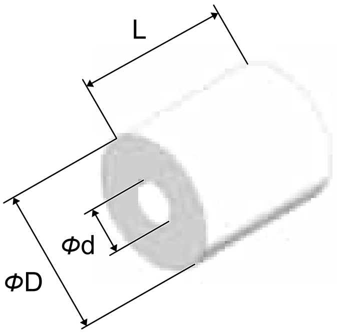
3. **First, insert the new wax and then insert the wax plate onto the shaft. Stick the needle for the wax plate all the way into the wax.**

CAUTION Be careful not to injure yourself while handling the wax plate needle.

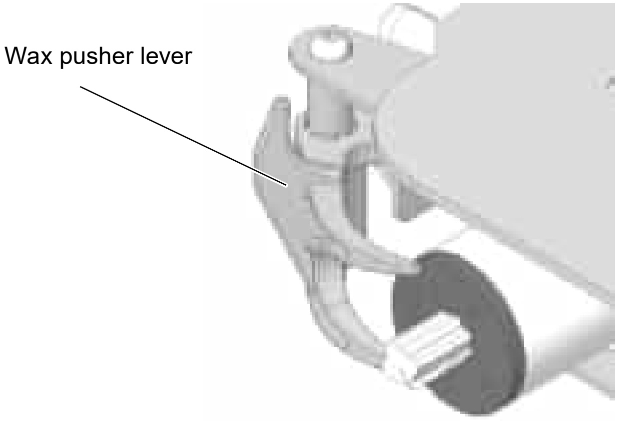


[Usable wax]

Shaft diameter (mm)	d (mm)	D (mm)	L (mm)
Φ12.5	Φ12.7 (Φ12.7 to Φ13.0)	Φ38 (Φ37 to Φ39)	Max. 45
Φ15.1	Φ15.3 (Φ15.3 to Φ15.6)		



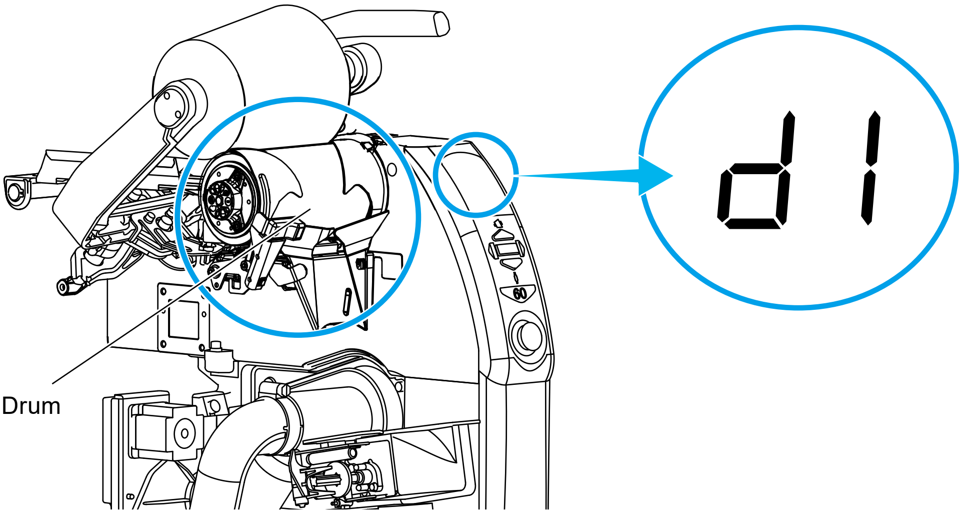
4. **Close the wax pusher lever, and ensure that it is on the left hand side of the wax plate.**
5. **Press the alarm reset button (middle) to start the winding unit.**



Sec 12 Other Operations by the Operator

12-1 Wound Yarn on Drum

If yarn is wound on the drum, “d1” will be displayed on the unit indicator and the winding unit will stop winding; follow the procedure below to take corrective action.



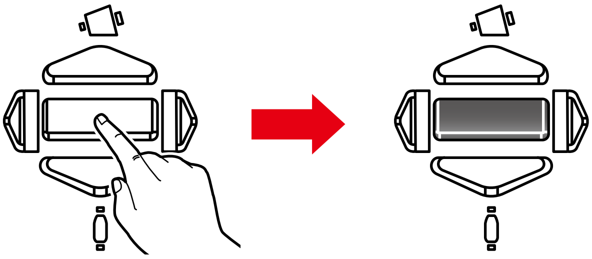
1. **Cut the yarn with scissors specifically designed for drums and then remove the unnecessary yarn.**

CAUTION Cut the yarn in the hole which is specifically designed for yarn cutting. Never use any other tool such as a sickle or a knife.

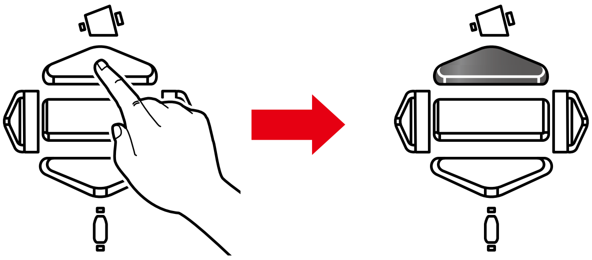
2. **If there are any knots or entangled yarn on the package surface, remove the surface layer.**
3. **Press the alarm reset button (middle) to start the winding unit.**
   The winding unit will automatically begin operation.

12-2 If a Defective Package Occurs

1. **Press the alarm reset button (middle) to stop the winding unit.**
2. **Remove the defective package.**



3. **Press and hold down the alarm reset button (top) for more than 0.2 seconds.**
   The re-tie pipe will pick up the lower yarn.



4. **Press the alarm reset button (middle) to start the winding unit.**

With AD	AD starts traveling and threading. You can also perform manual threading.
Without AD	You need to perform manual threading.

Adjustment Standards & Maintenance (General)

3
Chapter

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2 **Notes Relating to Maintenance 1**
3 **Electrical Parts Replacement................................. 2**
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  3-2 Replacing Electrical Components in the Winding Unit
  3-3 Fuse Replacement
  3-4 How to Use the Extracting Tool
4 **Leaning a Winding Unit Forward............................ 6**
5 **Detaching & Reattaching a Winding Unit.................. 8**
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  5-2 Detaching a Winding Unit
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Sec 1 Performing Maintenance

- The main mechanical parts, such as the cams and levers, are marked to show their correct orientation. Refer to the marks and mount them in their correct positions (so that the marks are facing toward you).
- The electrical components, such as the solenoid valves, solenoids, and sensors, are labeled with connector numbers.
  Ensure that the numbers always match the connectors when mounting and connecting them to the printed circuit boards.
- When attaching/detaching an air pipe, be sure to always stop the air flow beforehand. Be careful not to pull the pipe too forcefully.
- Where applicable, the gears have matchmarks for the parts that engage with each other.
- All the nuts and bolts used in this machine comply with the ISO screw requirements.
- If Muratec parts are not used, the specified machine performance and functionality may be compromised. To ensure stable operation, we recommend using Muratec parts, which can be purchased from Murata Parts Sales, Ltd.

Sec 2 Notes Relating to Maintenance

- When assembling the cams and cam levers or coupling rods, verify the engraved numbers and the matchmarks.
- Do not use a loose DR (E ring). Replace if necessary.
- No lubrication is necessary for the dry metal bush (DU Bush) on the rotary shaft.
- Refer to Chapter 3, 7-1 for details on the lubrication areas.
- Refer to the parts catalog (separate) for the part names and numbers.
- Send any PCBs that require repairing to Murata Part Sales Ltd., and include a situation report with as many details as possible.

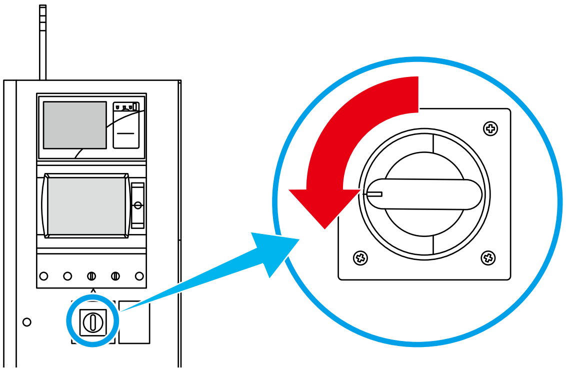
Sec 3 Electrical Parts Replacement

3-1 Replacing the electrical parts in the main control box

Switch off the power to the main control box before replacing electrical parts.
Before doing so, please follow the steps given below to open the door.

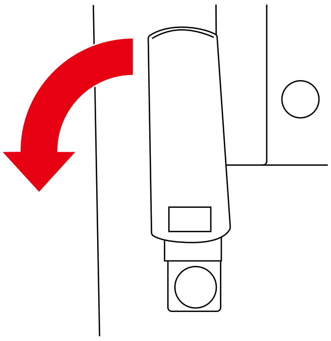
1. **Switch OFF the main switch on the main control box.**

   * Turn the switch 90 degrees to the left to turn it OFF.

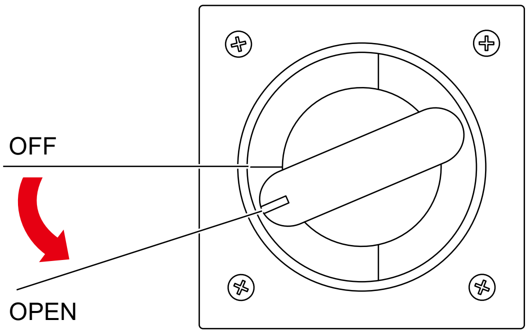


2. **Release the lock handle.**

   * Use the special tool to turn it 90 degrees to the left.



3. **From the OFF position, turn the main switch further in the direction shown by the arrow in the following photo (anti-clockwise), to turn it to the OPEN position, and then open the door.**



CAUTION

- Even if the main switch is hard to move, please ensure that you turn it to the OPEN position before opening the door.
- When turning the switch to the OPEN position, there is a chance that the switch will be hard to move or the door will be hard to open. In such cases, push the door, and at the same time turn the main switch to the OPEN position.
- Attempting to force open the door when the switch is not at the OPEN position may damage the main switch.

3-2 Replacing electrical components in the winding unit

Turn OFF the power to the winding unit before replacing any electrical components.
There are three methods for turning OFF the power. Use any of the methods shown below to turn OFF the power and replace the electrical components.

* Refer to Chapter 6 for details on the board replacement location.

DANGER

The winding unit is powered by a DC280 V electrical current which is extremely dangerous.

Turning OFF the power supply to one machine

1. **Press the stop button and turn the main switch OFF.**
2. **Replace the printed circuit board.**
3. **Turn the main switch ON and press the start button.**
   The machine is enabled for operation.

Turning OFF the power supply to one span

1. **Press the alarm reset button (middle) to temporarily stop the winding units located on the span which is to be turned OFF.**
2. **Open the cover located on the back of the main control box and switch OFF the breaker for that particular span.**
3. **Replace the printed circuit board.**
4. **Switch ON the breaker for the span and close the cover.**
5. **Press the alarm reset button (middle) to start up the winding units on the span.**
   The machine is enabled for operation.

Turning OFF the power supply to one winding unit

1. **Press the alarm reset button (middle) to temporarily stop each winding unit on the span (that contains the specific winding unit to be turned OFF).**
2. **Open the cover located on the back of the main control box and switch OFF the breaker for that particular span.**
3. **Remove the cable duct cover located at the back of the machine. Then, remove the PN connector for the winding unit where the printed circuit board will be replaced.**
4. **Switch ON the breaker for the span that was switched OFF in step 2.**
5. **Press the alarm reset button (middle) to start up the other winding units on the span.**
   All the winding units, except for the winding unit where the printed circuit board will be replaced, will be enabled for operation.
6. **Replace the printed circuit board.**
7. **Press the alarm reset button (middle) to temporarily stop the winding units that were restarted in step 5.**
8. **Switch OFF the breaker again for the span that was switched OFF in step 2.**
9. **Connect the PN connector for the winding unit where the printed circuit board was replaced.**
10. **Switch ON the breaker for the span that was switched OFF in step 8.**
11. **Press the alarm reset button (middle) to start up all the winding units on the span.**
    The span is enabled for operation.

3-3 Fuse replacement

Turn OFF the main switch, and troubleshoot and remove the cause of the blown fuse. Then, replace the fuse.

CAUTION

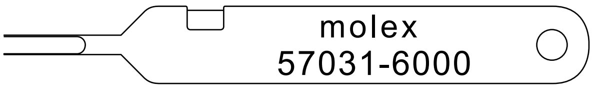
When a machine fuse has blown, always replace the fuse with a Muratec part.
Not using a Muratec fuse can jeopardize the protection of the circuit when an error occurs and can lead to an accident such as a blown fuse.
Refer to the electrical drawing for the Muratec fuse specifications.

3-4 How to use the extracting tool

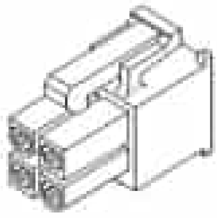
This extracting tool is used to extract or remove electrical wiring attached to the housing.

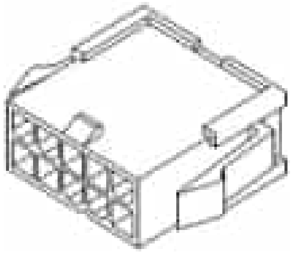
Model: 57031-6000

- **External view**



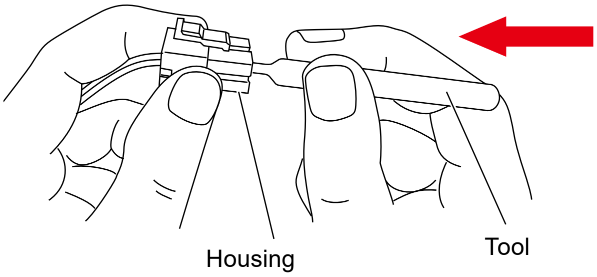
- **Applicable housing**


5557

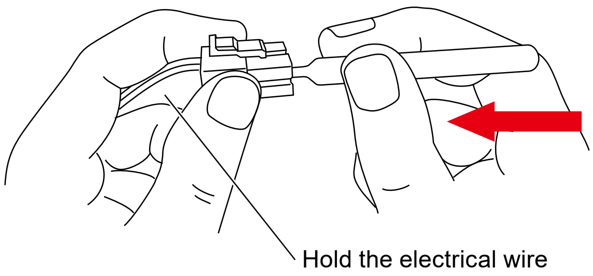

5559

- **Procedure**

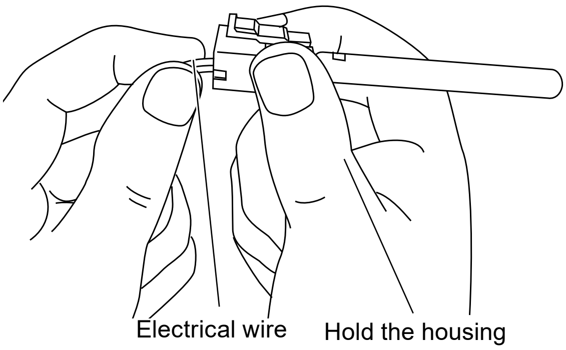
1. **Slowly insert the extracting tool from the opposite side of the electrical wire until it is just inside the housing.**



2. **Firmly hold the part close to the electrical wire housing, and then carefully push in the extracting tool until you reach the back of the housing.**

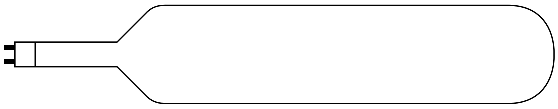


3. **Hold the housing while the extracting tool is inserted, and remove the electrical wire.**

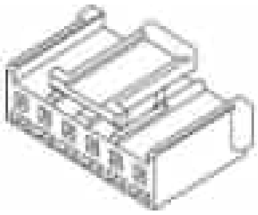


Model: 57309-6200

- **External view**



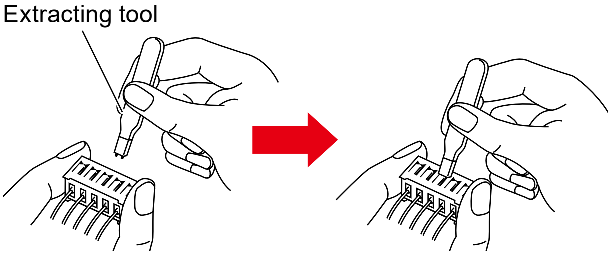
- **Applicable housing**



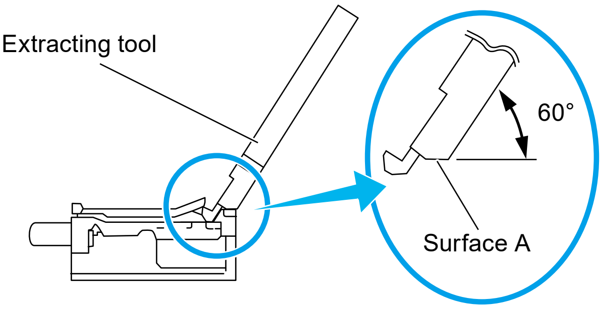
51103

- **Procedure**

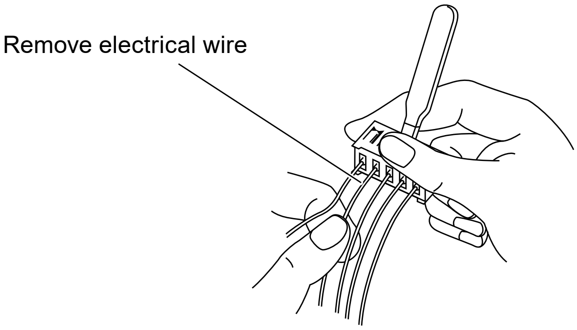
1. **Ensure that you hold the extracting tool so that the side labeled “Molex” faces forward. Use the key-shape part of the tool to hook into the housing.**


Extracting tool

2. **Insert the extracting tool at a 60° angle relative to the top surface of the housing, and remove the housing lance from the terminal.**
   If surface A is flush with the top surface of the housing, the tool will be at a 60° angle.


Extracting tool
60°
Surface A

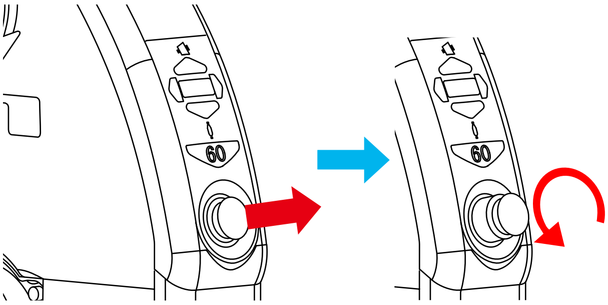
3. **Hold the extracting tool and the housing with one hand and remove the electrical wiring with the other hand to remove the terminal from the housing.**


Remove electrical wire

Sec 4 Leaning a Winding Unit Forward

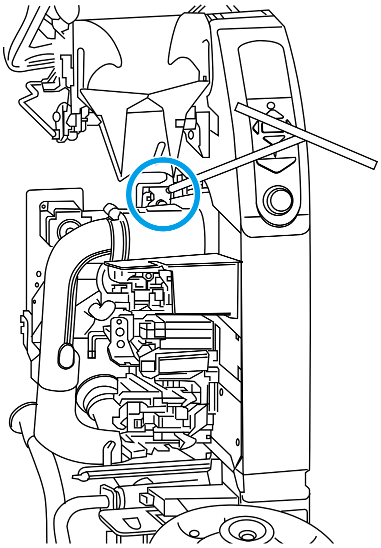
Leaning a winding unit forward becomes necessary for performing repairs, replacing parts and printed circuit boards and/or troubleshooting any faults occurring inside the winding unit.
The procedure is the same for Tray type and Magazine.

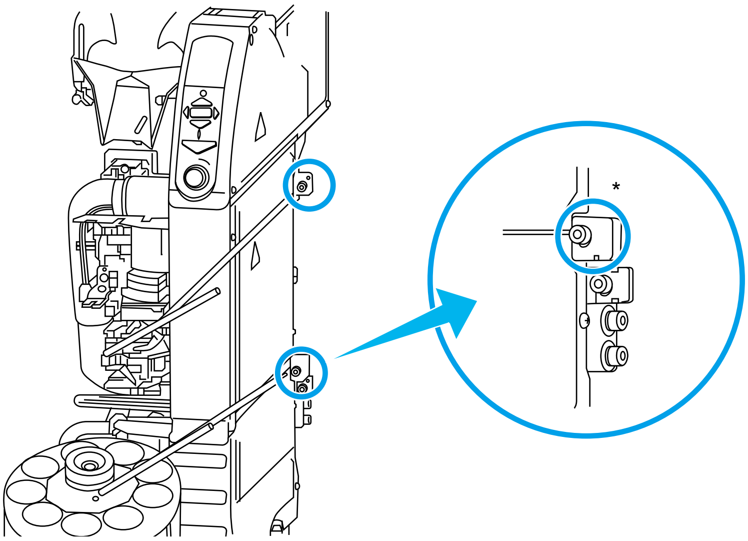
1. **Stop the blow cleaner.**
   * When using an AD (Auto Doffer) specification, stop the AD operation.
2. **Stop the winding unit by pulling the unit operation switch and rotating it to the left, and engaging the lock.**



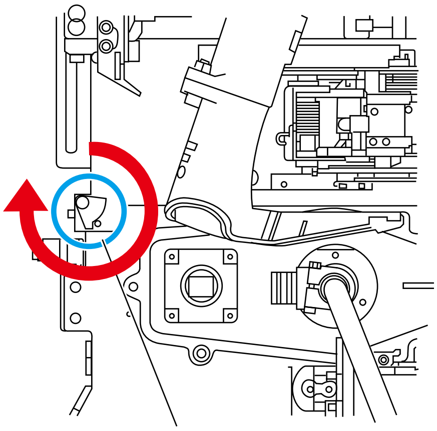
3. **Remove the 3 bolts using the winding unit wrench.**
   * There are two bolts: one is for leaning the winding unit and one is for lowering it. The removal bolt is different.

CAUTION It is extremely dangerous if you make a mistake by removing the wrong bolt, as the winding unit could come off the main frame. So, extreme care must be taken to identify the bolts correctly.

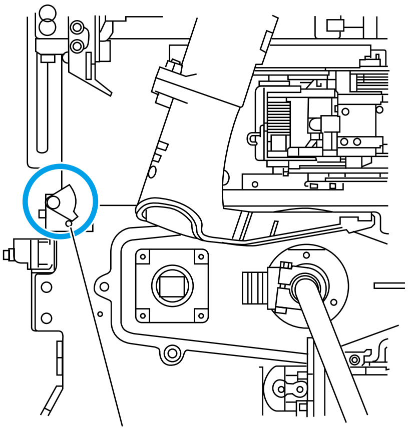




4. **Rotate the latch and release the lock.**



Locked

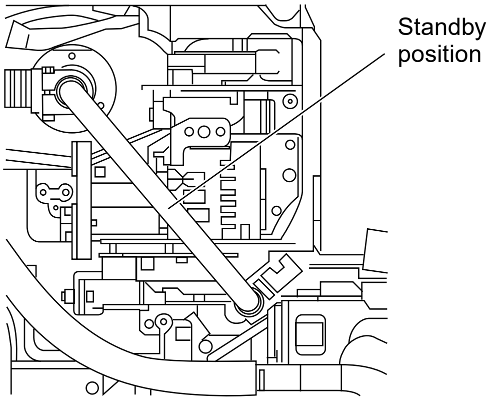


Released

5. **Ensure that the re-tie pipe is in the standby position.**

CAUTION

You can damage the machine if you lean the winding unit forward when the re-tie pipe is not in the standby position.

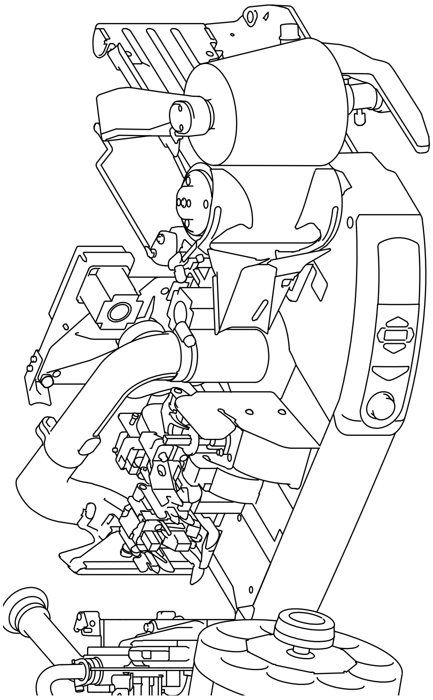


6. **Put your hands on the protruding part at the back of the drum motor, and lean the winding unit forward.**

* Wait for the drum motor to cool down before putting your hands on it.

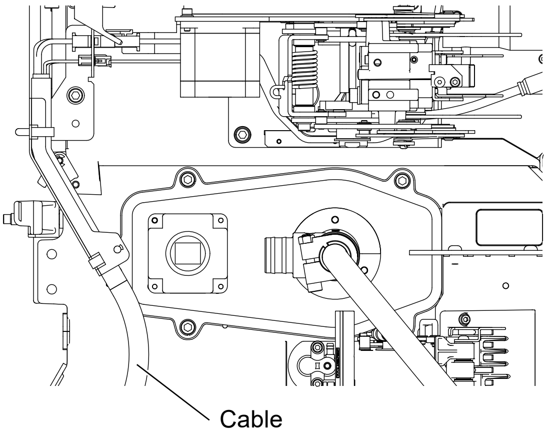
CAUTION

Do not touch the drum cover when leaning the winding unit forward.



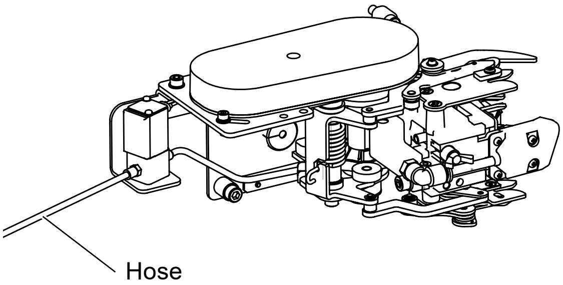
CAUTION

[Hot splicer specification]
When leaning the winding unit forward or returning it back to its original position, make sure that the cable does not get caught on the unit casing.



CAUTION

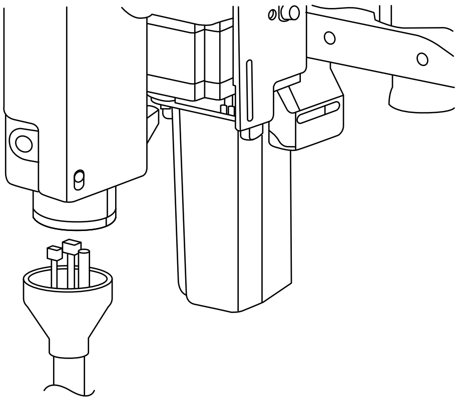
[Water splicer specification]
When leaning the winding unit forward or returning it back to its original position, make sure that the hose does not get caught on the unit casing.



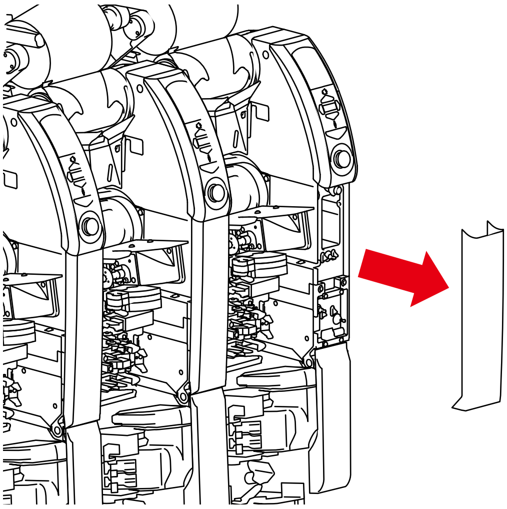
Sec 5 Detaching & Reattaching a Winding Unit

5-1 Preliminary steps before detachment & reattachment

1. **Turn OFF the main switch for the machine.**
2. **Stop the air supply to the machine.**
3. **Let out the remaining pressure in the pipe at the joints with the check valves that are located on each pipe end.**
4. **Move back the rubber cover on the connection area and remove the air pipe and electrical wiring for the ejector.**



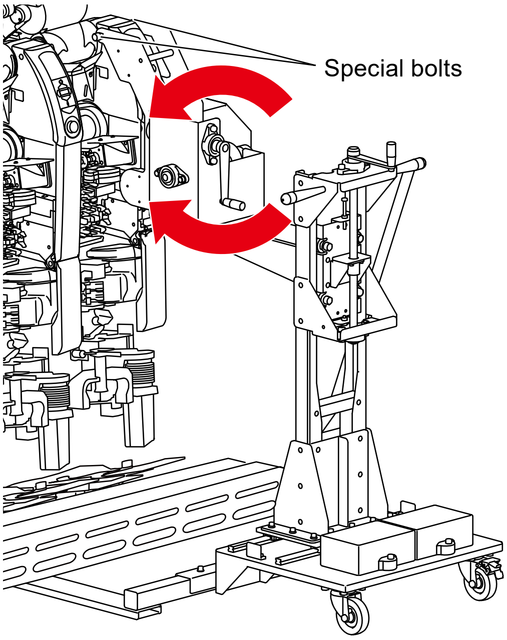
5. **Remove the front cover for the winding unit.**



6. **Reattach the winding unit carrier to the winding unit.**

CAUTION

Remove the clearer and PLC. If work is carried out with the clearer and PLC still attached, the cables may get caught in the unit carrier guide pads which could damage the cables.

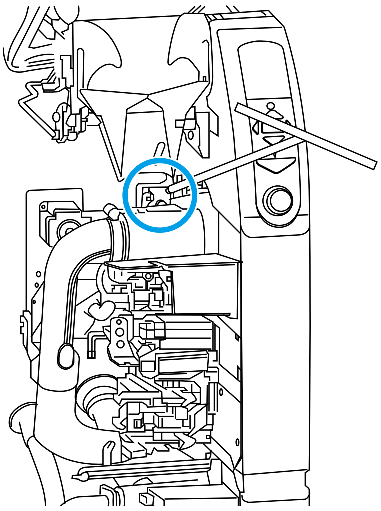


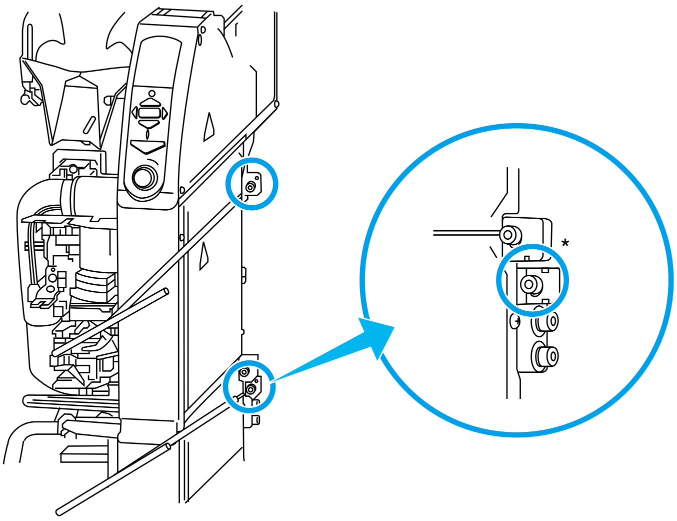
7. **Insert the special bolts into both holes on the winding unit casing.**
8. **Adjust the handle so that the stopper touches the middle of the winding unit.**

5-2 Detaching a winding unit

1. **At the back of the winding unit, remove the pipe and cable that are connected to the winding unit (Bal-Con and ejector).**
2. **Remove the 3 bolts using the winding unit wrench.**

* There are two bolts: one for leaning the winding unit and one for lowering it. The removal bolt is different.

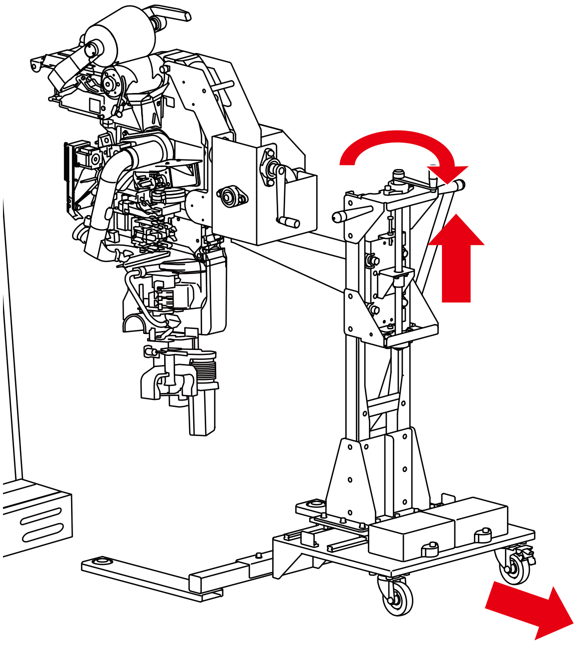




3. **Unfasten the winding unit cover.**

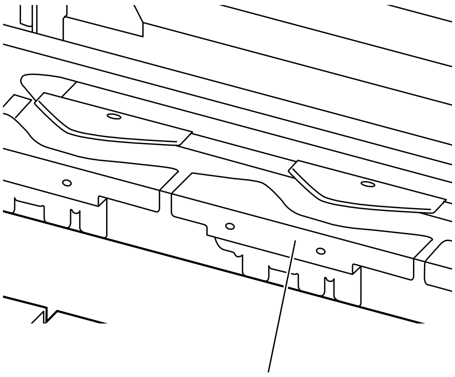
4. **Turn the handle for the winding unit carrier, and then lift up the winding unit and pull it towards you.**

* Machines are installed using the minimum necessary dimensions for spacing between machines.
If you are unable to pull the unit out, remove the guide ASSY and bracket on the front of the machine, then pull the unit out.
(If machines are installed facing each other, remove the parts from the machine opposite the machine for which you want to pull out the unit.)



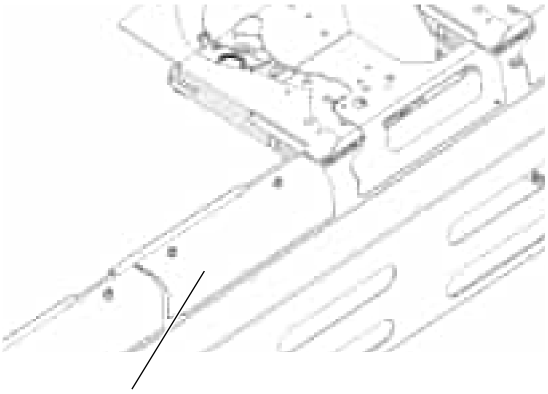
Detachment method for Bobbin Tray/Link Coner

1. **Attach the tray guide for the feed conveyor side frame to prevent trays from falling off the conveyor.**



Tray guide provided

2. **Attach the tray guide included with the machine on the return conveyor side frame.**



Tray guide provided
(for Right-hand machine)

5-3 Reattaching a winding unit

1. **Perform preliminary steps 1 through 3 in Section 5-1 before reattaching the winding unit.**
2. **After performing the procedure in Section 5-2 in reverse order, reattach the winding unit following steps 4 through 8 in Section 5-1 in reverse order (i.e. 8, 7, 6, 5, 4).**
3. **Verify that there is no air leaking from the rubber joint on the suction pipes for the suction mouth and the re-tie piping.**

Sec 6 Check Mode

6-1 Check mode

The “Check Mode” can be found on the VOS maintenance screen and is used for each winding unit check mode.

VOS screen

Maintenance → Maintenance → UNIT → Check Mode

* Each function selection can be setup for each group.

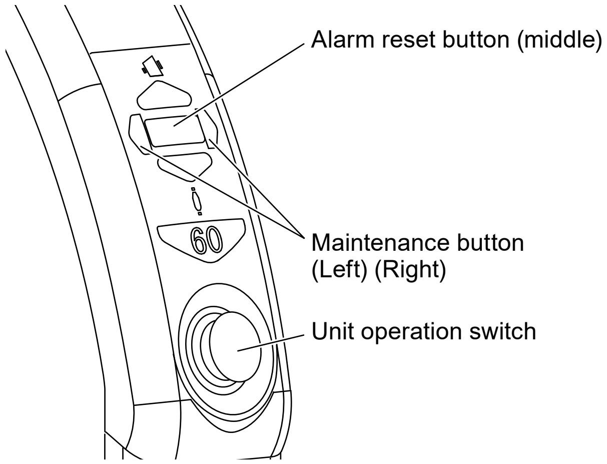
Setting items

- Check mode ON/OFF for all winding units
- Yarn defect sampling mode
- PC Bal-Con adjustment (Only possible while stopped)
- Splicer check
  - Untwisting check
  - Visual check
  - Water level check (Only possible while stopped)
  - Output check (Only possible while stopped)
  - Input check (Only possible while stopped)

Setting method

- **When turning the function ON/OFF for each group**

1. **Pull the unit operation switch to turn OFF the machine when using the check mode that can only be turned ON if the machine is stopped.**
2. **Select “Check Mode” from the VOS “Check Mode” screen.**
3. **Select ON or OFF for the setting: “Check Mode ON/OFF for All Winding Units” (on the VOS “Check Mode” screen), to enable or disable the check mode for all winding units.**



- **When turning the function ON/OFF for each winding unit**

1. **Pull the unit operation switch to turn OFF the machine when using the check mode that can only be turned ON if the machine is stopped.**
2. **Select “Check Mode” from the VOS “Check Mode” screen.**
3. **Press the maintenance buttons (right and left) at the same time.**
   The code No. for each check mode appears on the status display.
4. **Press the alarm reset button (middle).**
   Turn ON each check mode function.
5. **When turning OFF the check mode function, press both maintenance buttons (right and left) at the same time.**

6-2 Yarn defect sampling mode

This function commands the clearer to take cutting samples and check that the yarn is being cut according to the conditions that were set.
When the clearer cuts the yarn, the machine stops before performing the splicing operation. The machine can only stop for certain cutting types. You can select from the multiple sample settings that are available.

1. **After the yarn is cut, the alarm LED (middle) turns on and the winding unit stops.**
2. **Ensure that the clearer is performing the yarn defect sampling operation, and then press the alarm reset button (middle).**
   Operation restarts.

6-3 Drive operation check

Splicer operation check

1. **Press the alarm reset button (middle).**
   The LED5 (middle) flashes and the splicer stops in the Ln lever position.
2. **Press the alarm reset button (middle) again.**
   The LED5 (middle) turns on and the splicer stops at the home position.

Suction mouth operation check

1. **Press the alarm reset button (middle).**
   The alarm LED (middle) flashes and the suction mouth stops at the “upper yarn end find” position.
2. **Press the alarm reset button (middle) again.**
   The alarm LED (middle) turns on and the suction mouth stops at the home position.

Magazine can operation check

- **When operating only the magazine and the shutter**

1. **Press the alarm reset button (middle).**
   The alarm LED (middle) flashes, and only the magazine and the shutter perform the chute operation and stop at the chute position.
2. **Press the alarm reset button (middle) again.**
   The alarm LED (middle) turns on and the magazine and the shutter stop at the home position.

- **When also operating the peg at the same time**

1. **Press the alarm reset button (top).**
   The alarm LED (top) flashes, and only the magazine and the shutter perform the chute operation and stop at the chute position.
2. **Press the alarm reset button (top) again.**
   The alarm LED (top) turns off and the magazine, the shutter and the peg stop at the home position.

PC Bal-Con operation check

This function is used for adjusting the Bal-Con stop position and centering the Bal-Con and bobbin.

1. **Press the alarm reset button (middle).**
   The Bal-Con lowers and stops at the winding position.
2. **Press the alarm reset button (middle) again.**
   The Bal-Con rises to the top end position.

6-4 Splicer check

Untwisting check

1. **After the splicing operation, the winding unit stops before performing the twisting operation.**
2. **Check the condition of the yarn before being twisted, and then press the alarm reset button (middle).**

Visual check

1. **After the splicing operation, the winding unit stops.**
2. **Perform a visual check on the part where the yarn is spliced, and then press the alarm reset button (middle).**
   The winding operation starts.
3. **To cut the yarn, press the alarm reset button (middle).**

Water level check (water splicer only)

1. **Press the alarm reset button (middle).**
   The water splicer is filled with water several times.

   * If the alarm reset button (middle) is pressed again while the water splicer is being filled, the water filling operation is cancelled.

6-5 Output ceck

1. **Press the alarm reset button (middle).**
   Turn ON the set output.

6-6 Input check

When the set input is turned ON, the maintenance LED (green) turns ON.

6-7 DATA

The data for each setting appears on the status display.

* The alarm code is displayed when an alarm occurs.

Package diameter (D0 to D2)

The status for the package diameter is displayed as D0, D1 or D2.

Measuring the remaining yarn

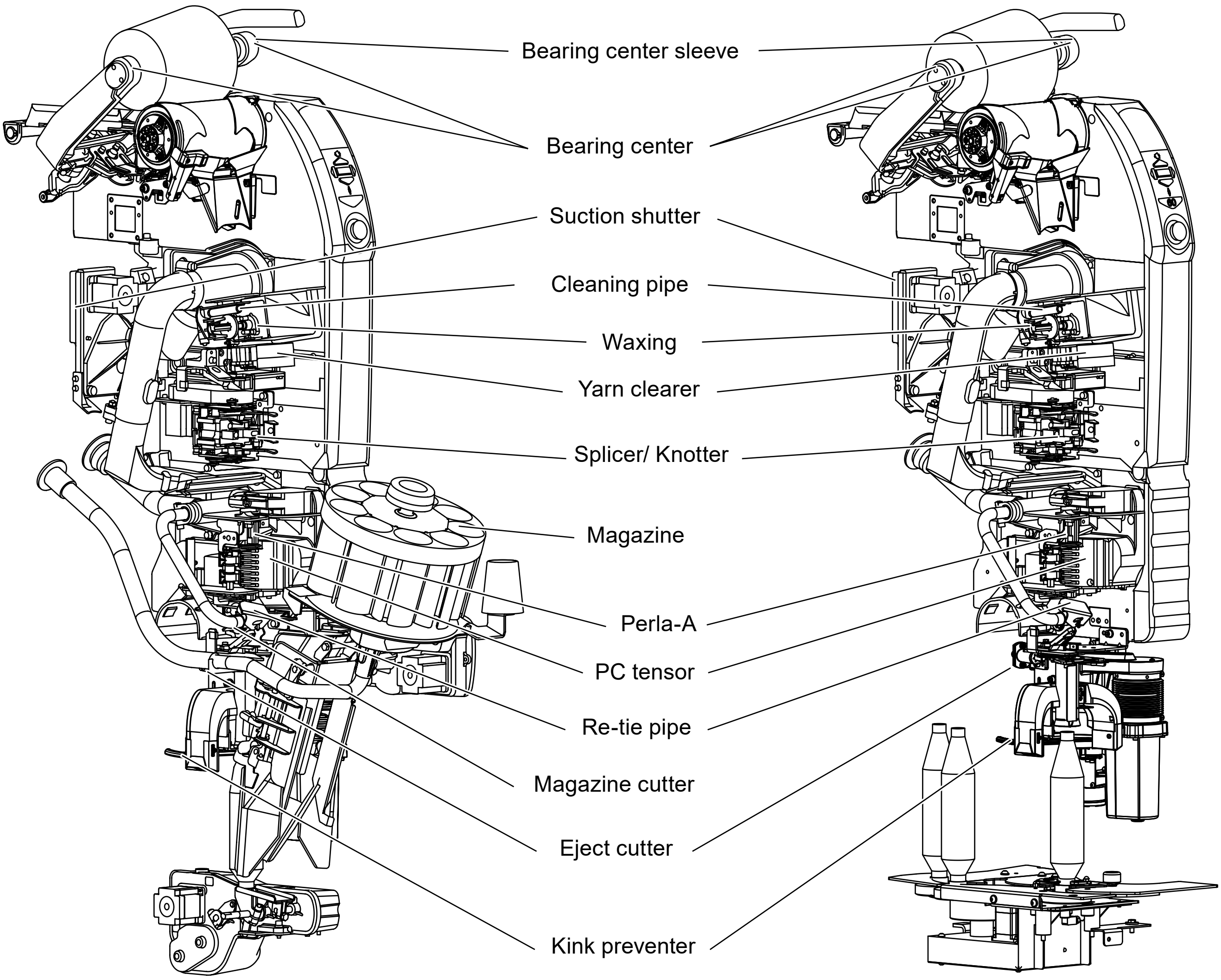
The remaining yarn left on the preceding bobbin is displayed.

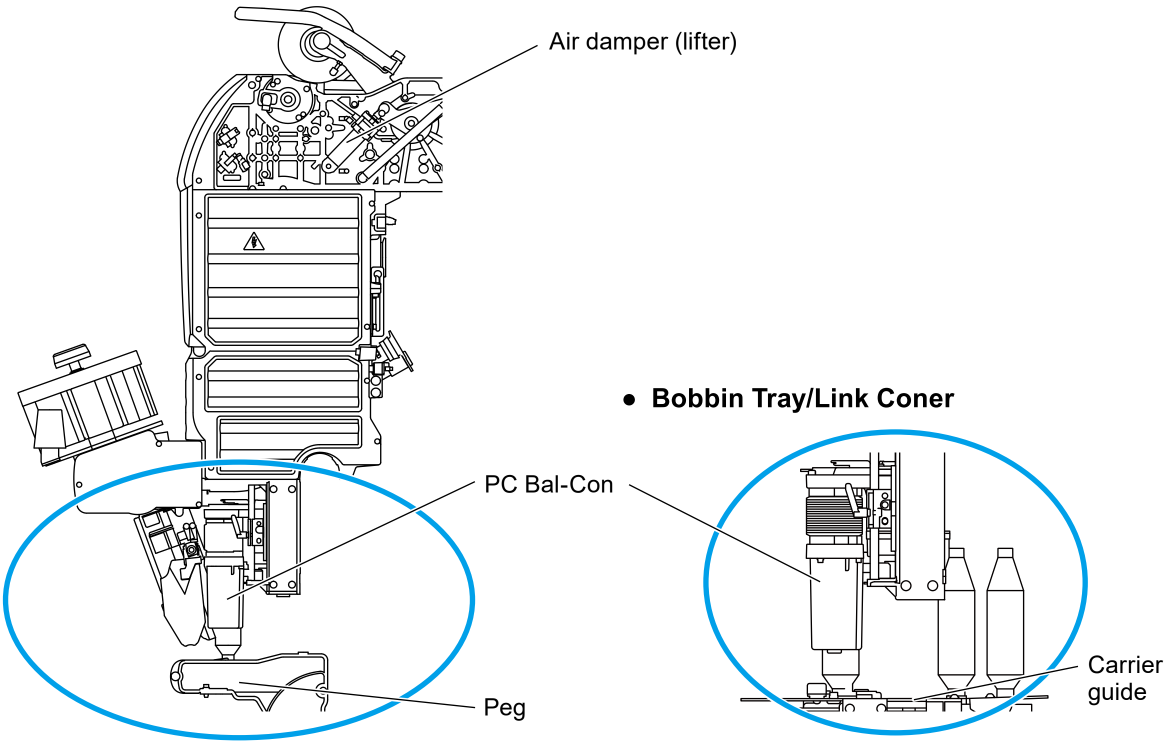
Remaining Yarn = The amount of yarn wound from the bobbin after the Bal-Con reaches the bottom end position (out of the total amount of winding yarn for one bobbin)

* After loading the full bobbin, perform a visual check to ensure that the bobbin is being wound completely.

Inspection

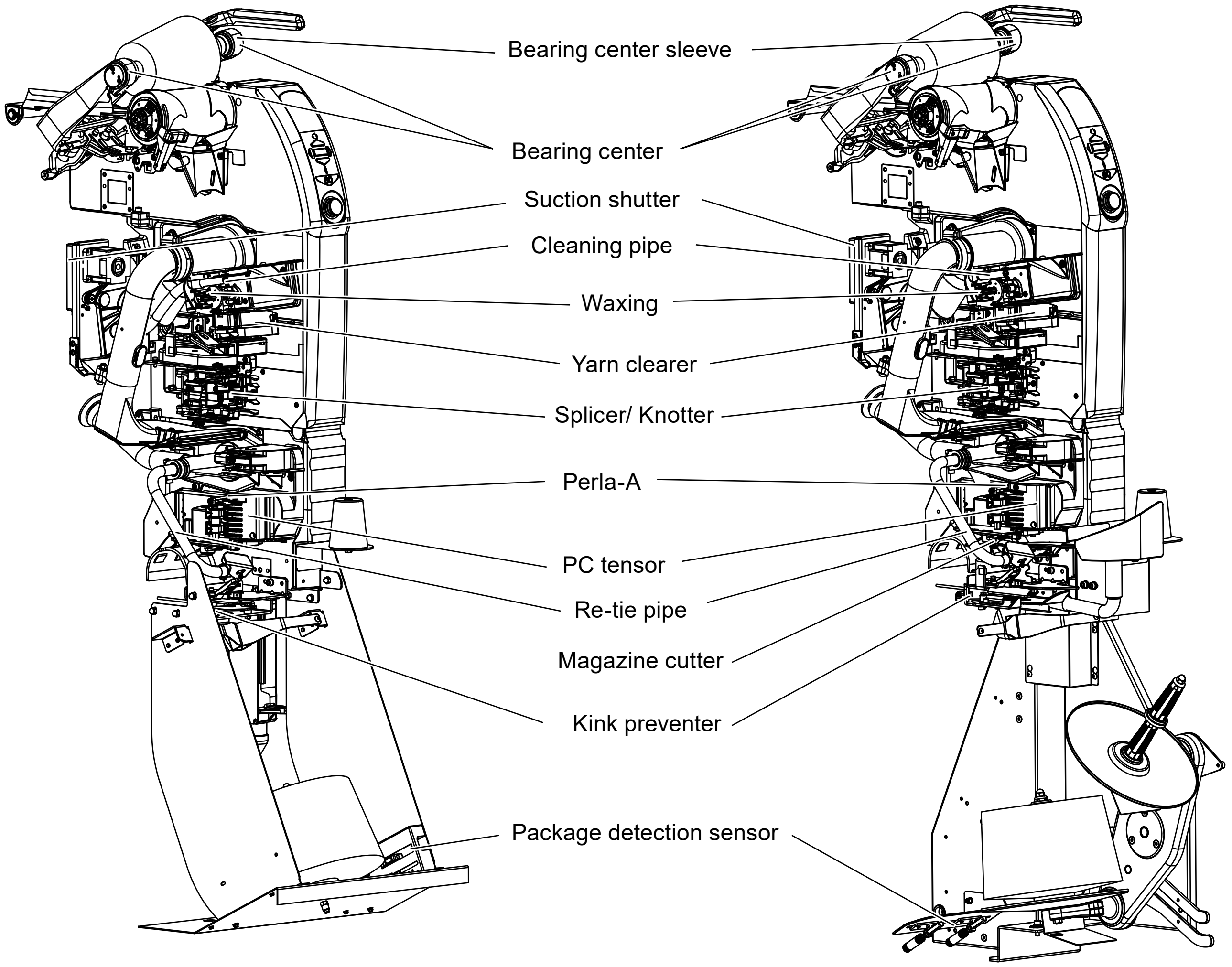
Straight Magazine **Bobbin Tray/Link Coner**


Bearing center sleeve
Bearing center
Suction shutter
Cleaning pipe
Waxing
Yarn clearer
Splicer/ Knotter
Magazine
Perla-A
PC tensor
Re-tie pipe
Magazine cutter
Eject cutter
Kink preventer

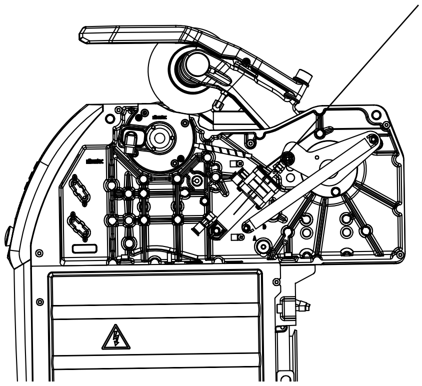

Air damper (lifter)
● Bobbin Tray/Link Coner
PC Bal-Con
Peg
Carrier guide

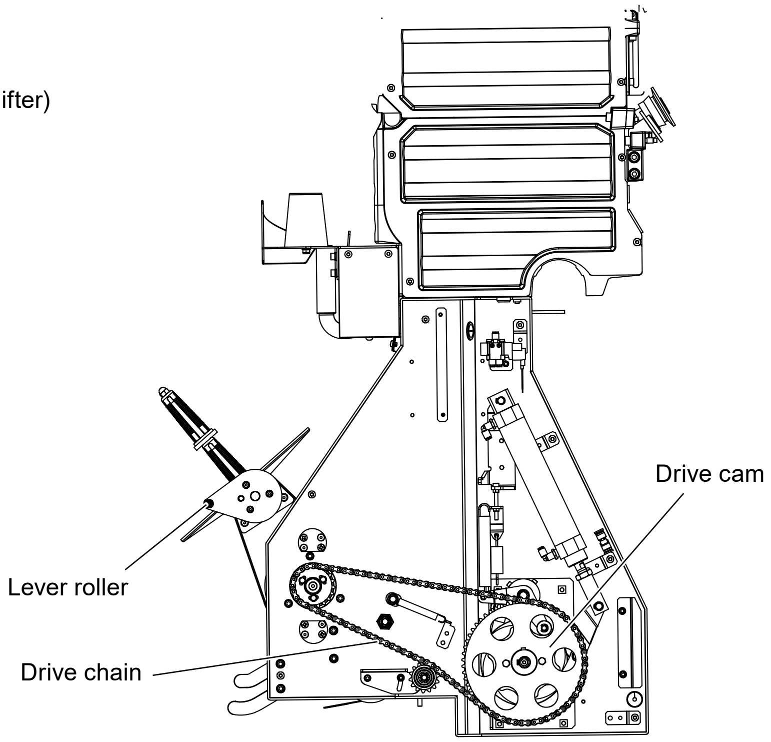
Cone to Cone Model-I

Cone to Cone Model-II


Bearing center sleeve
Bearing center
Suction shutter
Cleaning pipe
Waxing
Yarn clearer
Splicer/ Knotter
Perla-A
PC tensor
Re-tie pipe
Magazine cutter
Kink preventer
Package detection sensor

Cone to Cone Model-I/Model-II


Air damper (lifter)


Drive cam
Lever roller
Drive chain

7-1 Periodicinspection

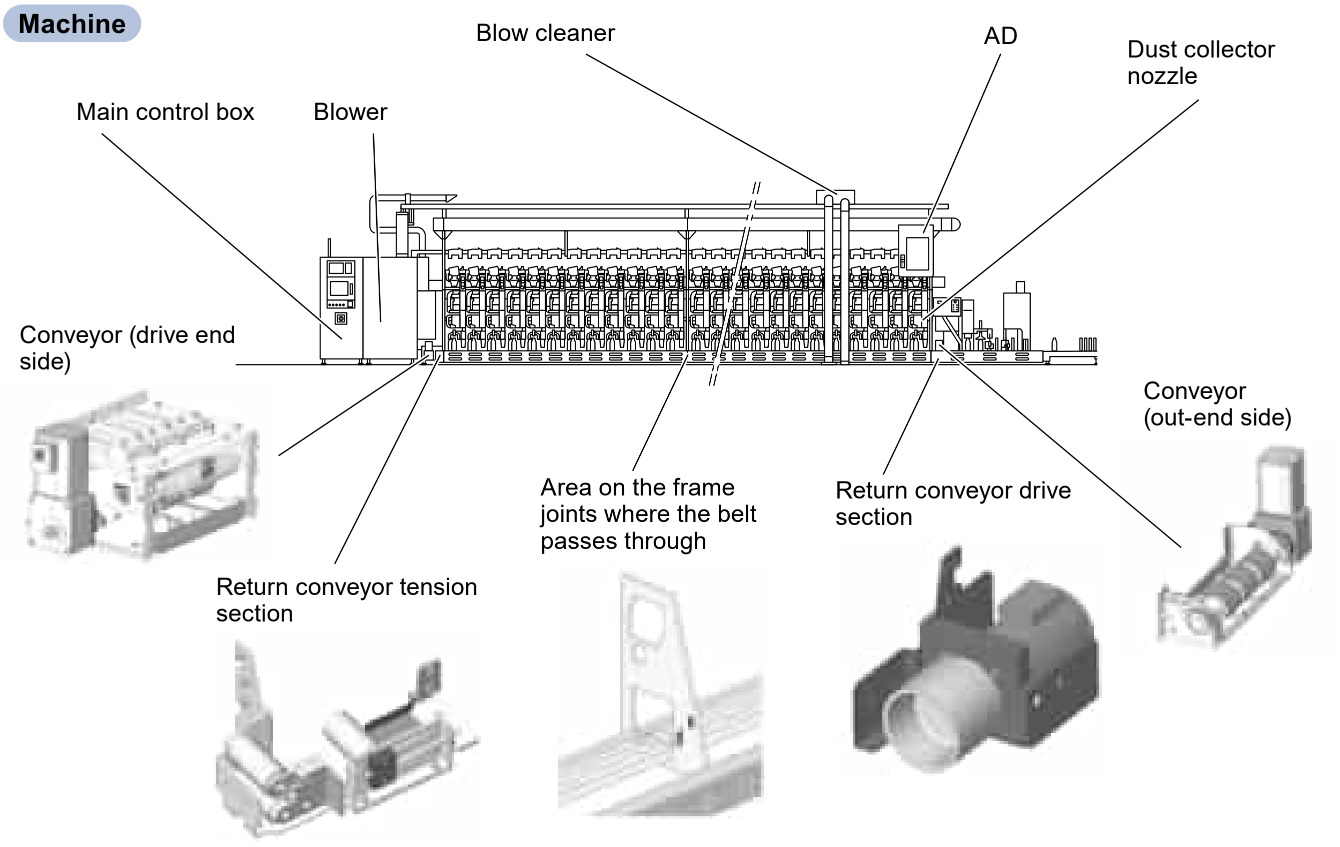
Inspection & lubrication (frequency)

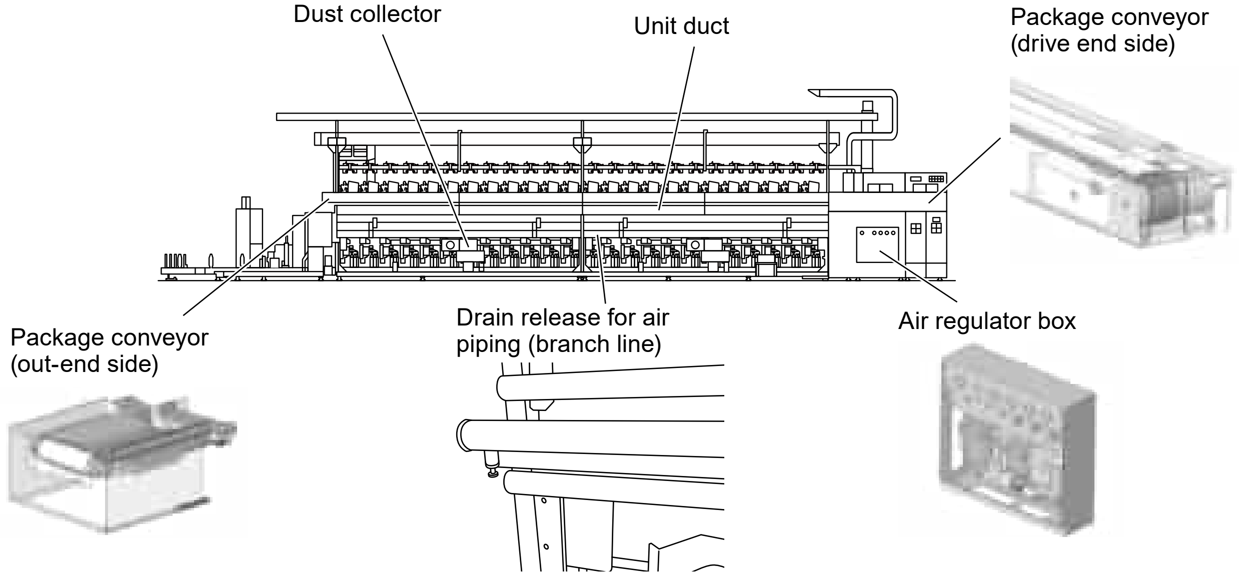
Frequency	Section	Guideline	Maintenance time	
			Min. per winding unit	Min. per 60 winding units
Daily	Water splicer *Refer to Chapter 4Hb and 4Hc	• Clean V-shape area of splicer nozzle and untwisting block with commercial brush (with nylon bristles), etc. • Check for wear or damage on untwisting block beater	---	---
		• Clean V-shape area of splicer nozzle, upper and lower guides and inner surface of untwisting pipe with commercial brush (with nylon bristles), etc. • Clean untwisting pipe with standard tool brush		
	Hot splicer *Refer to Chapter 4Hd	Check if the nozzle temperature rises within one minute after the machine starts.		
Weekly	Waxing	Clean only the winding unit(s) with wax or yarn waste buildup around wax holder	1	60
	Cleaning pipe	Clean only the winding unit(s) with clogged pipes		
	PC tensor	Clean only the winding unit(s) with yarn waste entangled on gate		
	Re-tie pipe	• Perform visual check • If necessary, remove waste by hand or by blowing air	---	15
	Perla-A	Drain and element inspection/replacement • Is it automatically draining? • Have two years passed since you began using it? (Or, as a guideline, when measuring pressure with a check valve during operation, does it reach 0.01 MPa?)		2 (30)
	Water splicer *Refer to Chapter 4Hb and 4Hc	• Check for faults with water supply solenoid valve(s) • Check whether water is continuing to discharge or is not discharging at all (visual check, as well as splicing performance check)		---
	Air splicer *Refer to Chapter 4Ha	• Check splice for appearance and strength (Pull gauge) • Check the cutter sharpness (visual check) • Check for any air discharge errors or faults • Check whether or not the air is continuing to discharge or is not discharging at all (visual and sound check, as well as splicing performance check)		
	Hot splicer *Refer to Chapter 4Hd			
	Package detection sensor (Cone to Cone Model-I, II)	Remove any cotton fly stuck near the sensor and reflector	1	60
Monthly	PC Bal-Con	Clean cotton fly around Bal-Con sensor	1	60
	Water splicer *Refer to Chapter 4Hb and 4Hc	Remove splicer and clean	---	---

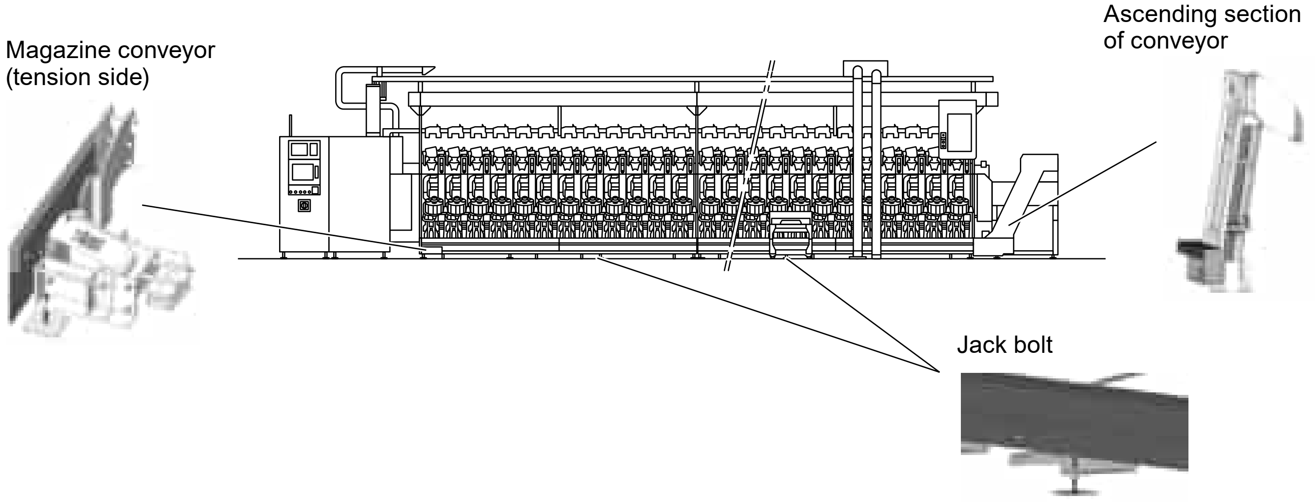
Frequency	Section	Guideline	Maintenance time	
			Min. per winding unit	Min. per 60 winding units
Every 2 months	Suction shutter	Check and clean cotton fly buildup around shutter operation area	2	120
Every 3 months	Water splicer *Refer to Chapter 4Hc	After removing cotton fly from clamp cutter, lubricate axis (blade lubrication not required) * ISO VG10 (Bearing oil)	---	---
	Air splicer *Refer to Chapter 4Ha			
	Hot splicer *Refer to Chapter 4Hd			
	Bearing center (R side) *Refer to Chapter 4Ba	Lubricate packing and bush on slide section * Silicone oil	---	60
Every 6 months	Re-tie pipe *Refer to Chapter 4Ga	Remove any cotton fly that is clogged in the shaft and boss (Only for the corresponding winding units)	15	---
	PC Bal-Con	Check the following parts: guide shaft, slide screw, arm guide and arm guide felt * Remove old grease and lubricate when necessary * MOLYKOTE EM-50L	---	---
	Bearing center (R side) *Refer to Chapter 4Ba	Remove any cotton fly that is jammed inside		60
		Lubricate bearing center * Klüber		180
	Air damper (lifter) *Refer to Chapter 4Ba	Remove dirty or old grease and apply new grease * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2 * Do not use grease containing molybdenum disulfide.		300
	Air splicer *Refer to Chapter 4Ha	Remove splicer and clean		---
	Hot splicer *Refer to Chapter 4Hd			
	Kink preventer	• Remove solenoid (for linear motion) plunger and clean * Do not lubricate plunger. • Clean and lubricate spring hook and stopper * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300

Frequency	Section	Guideline	Maintenance time	
			Min. per winding unit	Min. per 60 winding units
Yearly	Magazine	Clean and lubricate latch inside base and feed lever (slide section) * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Magazine cutter	Clean and lubricate packing parts inside cylinder * Use maintenance tools * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2	5	300
	Eject cutter		5	300
	Kink preventer (Cone to Cone Model-II) *Refer to Chapter 4Tb		5	300
	Kink preventer *Refer to Chapter 4Ma	Remove solenoid (for linear motion) plunger and clean * Remove the old grease and apply grease to plunger when necessary * MOLYKOTE EM-50L	5	300
	PC Bal-Con	Apply grease to the part that holds the guide shaft * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Peg	Remove cover, clean inside, and lubricate rod and spring *When performing maintenance, remove only the peg unit. * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Ejector	Remove cover, clean inside, and lubricate rod and spring * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Control box, Unit duct	• Check all components and electrical wiring for discoloration and corrosion • Check that all bolts, screws, and connectors are fastened securely • Check all control components (for example, contact surfaces of all relays and burnt out display bulbs) • Measure insulation resistance • Check all voltages • Check all parts for abnormal heat generation • Clean • Check that all bolts and connectors at terminals are tightened securely • Check all wiring for overheating, discoloration, or deformation	---	150
	Air splicer *Refer to Chapter 4Ha	Clean inside untwisting pipe with standard tool brush		
	Hot splicer *Refer to Chapter 4Hd			
	Ball latch (Cone to Cone Model-II) *Refer to Chapter 4Tb	After removing the ball latch and cleaning the area, apply grease to the entire surface of the ball. * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Lever roller (Cone to Cone Model-II) *Refer to Chapter 4Tb	After cleaning around the roller, remove the roller and apply grease around the circumference of the internal pin * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2	2	120
	Drive chain (Cone to Cone Model-II) *Refer to Chapter 4Tb	Apply grease all around the chain * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	5	300
	Drive cam (Cone to Cone Model-II) *Refer to Chapter 4Tb	Apply grease around the circumference of the cam and to the spring hook *Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type) *Be careful not get grease on the circumference of the brake disc	5	300
	Bearing center sleeve *Refer to Chapter 4Ba	Apply grease to the interior O ring * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2	5	300
For lot changes	Water splicer *Refer to Chapter 4Hb and 4Hc	Check appearance of splice and its strength (pull gauge)	---	---
	Air splicer *Refer to Chapter 4Ha			
	Hot splicer *Refer to Chapter 4Hd			

Machine


Blow cleaner
AD
Dust collector nozzle
Main control box
Blower
Conveyor (drive end side)
Conveyor (out-end side)
Area on the frame joints where the belt passes through
Return conveyor drive section
Return conveyor tension section


Dust collector
Unit duct
Package conveyor (drive end side)
Package conveyor (out-end side)
Drain release for air piping (branch line)
Air regulator box


Magazine conveyor (tension side)
Ascending section of conveyor
Jack bolt

Inspection & lubrication (frequency)

Frequency	Section	Guideline	Maintenance time Min. per machine
Daily	Dust collector *Refer to Chapter 5Da	Check cotton fly buildup on suction nozzles for all winding units • Perform visual check for cotton fly clogging on each yarn waste duct • Perform visual check for clogged filter • Check for cotton fly buildup on shutter	1
	AD *Refer to Chapter 9	Remove cotton fly around photoelectric tubes, and cotton fly stuck to rail brushes with air gun	15
Weekly	Air *Refer to Chapter 5Aa and 5Ab	Drain and element inspection/replacement • Is regulator drain on back side of blower performing draining operation automatically? • Remove each drain from air pipe joints on rear side of machine	12
	Package conveyor *Refer to Chapter 5Ca	Remove yarn waste from conveyor brushes (2 locations) on drive end and out-end sides behind machine	5
	Tray conveyor *Refer to Chapter 5Fa	• Remove yarn waste from conveyor brushes (2 locations) on drive end and out-end sides behind machine • While conveyor is stopped, remove yarn waste from drive end and out-end tension sections and clean span joints • With the conveyor stopped, remove all yarn waste and clean the return conveyor drive section and tension section	25
	Magazine conveyor *Refer to Chapter 5Ha	Clean conveyor brushes, jack bolts and drive end and ascending section of conveyor on front of machine	5
Monthly	Blower *Refer to Chapter 5Ba	Remove blower front cover and clean impeller	10
	Package conveyor *Refer to Chapter 5Ca	Remove the drive-end side cover and remove any cotton fly buildup inside	15
	Dust collector *Refer to Chapter 5Da	• Remove cotton fly on suction nozzles for all winding units behind machine • Perform visual check for clogged filter • Check for cotton fly buildup on shutter	1 × 60 winding units
		Clean filter, shutter, and air cylinder	30
	Blow cleaner *Refer to Chapter 5Ea	Clean filter inside traveling devices	15
	Magazine conveyor *Refer to Chapter 5Ha	Remove yarn waste (around pulley while conveyor is stopped) from ascending section of conveyor	5
	Main control box *Refer to Chapter 6	• Clean the side cover filter • Remove the cover, and clean any clogged filters using an air gun, etc.	10
	AD *Refer to Chapter 9	• Remove cotton fly around cutter with air gun • Lubricate cutter and clamp plate axes * ISO VG10 (Recommend dry type)	10
Every 6 months	AD *Refer to Chapter 9	• Clean chain and cam follower with air gun after removing top and side covers • Use vacuum cleaner to suck out cotton fly around electrical equipment	30
		Lubricate travelling chain while top cover is removed * ISO VG68 (Lubricant)	15
Yearly	Blower *Refer to Chapter 5Ba	Use reference table and check static pressure on static pressure gauge located on out-end of machine	10
	AD *Refer to Chapter 9	Lubricate cylinder in air cylinder shaft while air is shut off * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2 * Do not use grease containing molybdenum disulfide.	15
Every 2 years	Air *Refer to Chapter 5Aa and 5Ab	Replace element on regulator located on back side of blower	15

Precautions during inspection (electrical)

- **Always turn the main switch OFF during checks that do not require power.**
  (When performing maintenance, place a sign on the machine saying “Maintenance in progress. Do not turn the main switch on!”)
- **Inform other operators before performing any checks that require the machine to be turned on or to be operated.**
- **During the inspection, ensure that you do not damage any functioning parts.**
- **After the inspection, ensure that the following steps have been undertaken before turning the main switch ON: All bolts that were loosened during the inspection have been securely tightened. All tools or measuring instruments that were used during the inspection have been removed. All wiring or cables that were disconnected during the inspection have been re-connected.**

CAUTION

During and after the inspection, be sure to re-tighten the terminal bolts.
Loose terminal bolts can lead to a burn out of the electrical equipment.

- **When cleaning the light receptor and the projector for the photoelectric sensor, wipe them both clean with a dry, soft cloth, a cloth moistened with water, or water diluted with mild detergent. Do not use alcohol based agents (thinner, benzine, etc.).**
- **When removing the cotton fly, use a vacuum cleaner to suck it out.**

CAUTION

Do not use compressed air to blast the cotton fly when cleaning. Using compressed air causes the cotton fly to get inside the electrical equipment leading to an electrical malfunction.

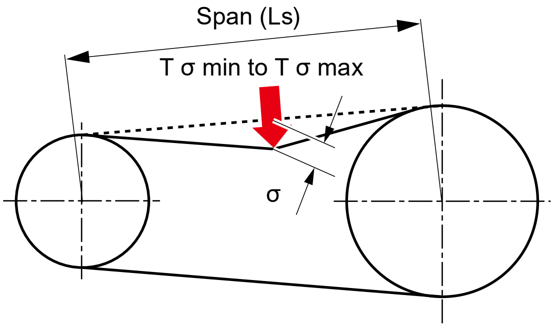
7-2 Tightening the belts

Tightening the belts

- **How to check if the belt has been tightened to the specified tension using deflection and load**

Tighten the belt so that when the deflection is (σ), the load falls between T σ min and T σ max.

Mechanism	σ (mm)	Tσ min (N)	Tσ max (N)
Re-tie pipe	1.6	2.5	3.2
Suction mouth	1.6	2.5	3.2
Suction shutter	1.0	2.6	3.2
Yarn guide lever	0.5	2.7	3.3
Magazine	1.1	2.4	3.0
Splicer	1.5	2.6	3.3
Bal-Con	1.6	2.9	3.5
Peg	0.9	2.4	3.0
Ejector	1.4	2.6	3.2
Rewind Magazine	1.6	2.5	3.2

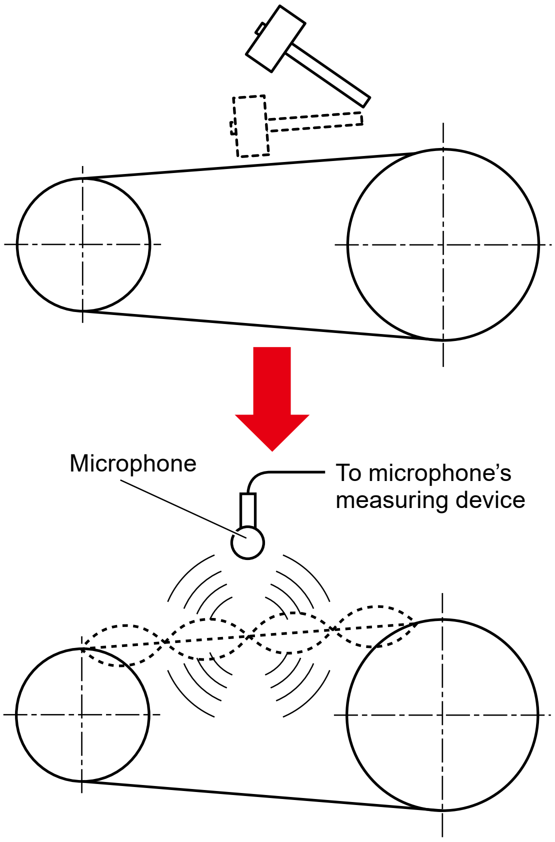


- **How to check if the belt has been tightened to the specified tension by measuring the belt vibrations (acoustics)**

Tighten the belt so that the frequency is between F min and F max.
Measure the sound of the belt when plucking or hitting it in between spans using a sonic tension meter.

Timing belt unit mass	0.019 kg/(10 mm width × 1 m length)
Belt width	8 mm

Mechanism	Ls (mm)	F min (Hz)	F max (Hz)	Recommended belt tension (N)
Re-tie pipe	98	203	236	30.2 to 40.6
Suction mouth	98	203	236	
Suction shutter	62	321	373	
Yarn guide lever	34	586	680	
Magazine	67	297	345	
Splicer	92	217	251	
Bal-Con	102	195	227	
Peg	57	350	405	
Ejector	92	224	260	
Rewind Magazine	98	208	236	



Sec 8 Oil Reference Table

No.	Lubricant specification	Lubricant product
1	Extreme-pressure lithium-based grease with mineral oil, NLGI No.2	Shell: Alvania EP Grease 2 EXXON Mobil Corporation: Mobilux EP-2 JXTG Nippon Oil & Energy Corporation: Epnoc Grease AP-2 Cosmo Oil Co., Ltd.: Cosmo Grease Dynamax EP 2
2	ISO VG10 (Bearing oil)	Shell: Tellus Oil C10 EXXON Mobil Corporation: Velocite Oil No. 6 (VG10) JXTG Nippon Oil & Energy Corporation: Super Mulpus 10 Cosmo Oil Co., Ltd.: Cosmo New Mighty Super 10
3	Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)	Shell: Alvania Grease HDX Cosmo Oil Co., Ltd.: Cosmo Molybdenum Grease
4	Use the designated product (right column)	NIPPON GREASE Co.,Ltd. (MURATA PARTS SALES.LTD.): NIGACE Klüber Lubrication München SE & Co. KG: KLUBERPLEX BE31-222
5	Use the designated product (right column)	MURATA PARTS SALES.LTD.: Silicone oil
6	ISO VG68 (Lubricant)	Idemitsu Kosan Co.,Ltd.: Daphne Mechanical Oil 68 Shell: Tellus Oil C68 EXXON Mobil Corporation: Teresso 68 JXTG Nippon Oil & Energy Corporation: FBK Oil R068
7	Use the designated product (right column)	DuPont Toray Specialty Materials K.K.: MOLYKOTE EM-50L

* Product names are the trademarks or registered trademarks of each manufacturer company.

* Do not mix lubricants made by different manufacturers or which have different specifications.
* NLGI No.: Scale of grease consistency regulated by National Lubricating Grease Institute
* A sample is included for some lubricants.
  Refer to the corresponding homepage of each manufacturer for product use and handling.
  (The name of the product that is included is noted on the label.)

Sec 1 Adjustment Standard

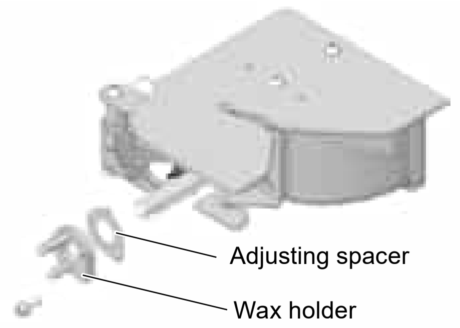
1-1 Amount of Wax Applied

Adjust the degree of contact between the wax and the yarn by changing the number of spacers used. Remove the wax holder to replace the adjusting spacer.

Reference for No. of Adjusting Spacers

Yarn count applied	No. of spacers (t = 0.2 mm)
Ne 3 to 20	0
Ne 21 to 40	1
Ne 40 to	2

* Figures vary slightly depending on the winding conditions.

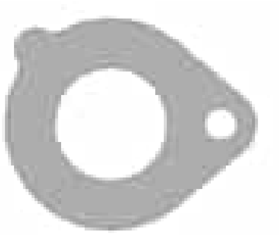


* There are two standard thicknesses for the adjusting spacers:
0.2 mm and 0.1 mm. Finer adjustments can be obtained by combining the spacers with different thicknesses.

[Spacer combination (example)]

	Spacer combination (No. of spacers)	
Target value (mm)	**0.1 mm**	**0.2 mm**
0	---	---
0.1	1	---
0.2	---	1
0.3	1	1
0.4	---	2
0.5	1	2
0.6	---	3

0.1 mm

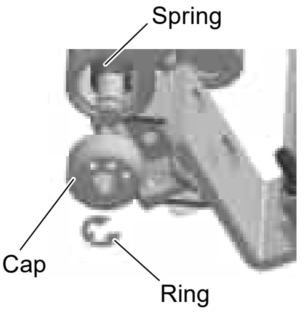

0.2 mm

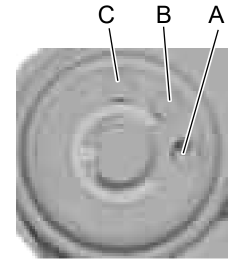
1-2 Adjustment of Wax Holding Force

Reduce the holding force if a deep groove can be made in the wax surface that touches the wax holder.

1. **Remove the ring and cap.**
2. **Change and adjust the hole that holds the spring.**

* The factory setting is position C.





(Tight) A-B-C (Loose)

1-3 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

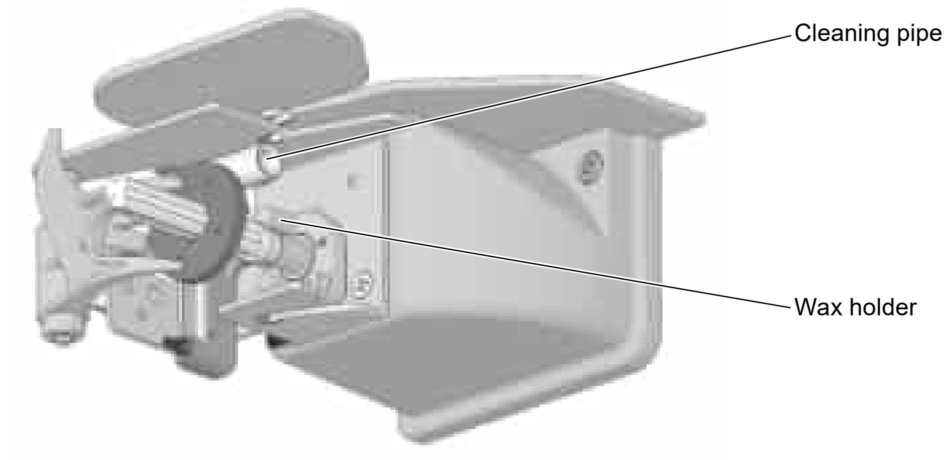
Waxing Device	Select “With”
Wax Motor Rotation Speed	Set the required rotation speed
Wax Remaining Amt Alarm	Input the time period when necessary

Sec 2 Maintenance

2-1 Cleaning

If there is any cotton fly or fly wax buildup, the waxing operation may not perform correctly.

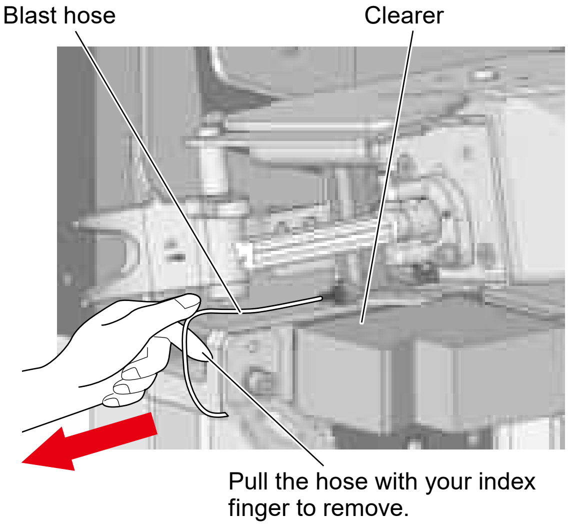
Frequency	Item	Guideline
Weekly	Wax holder	Remove cotton fly and the wax buildup around the wax holder
	Cleaning pipe	Remove cotton fly that is clogged in the pipe


Cleaning pipe
Wax holder

2-2 Blast Hose Removal from Clearer

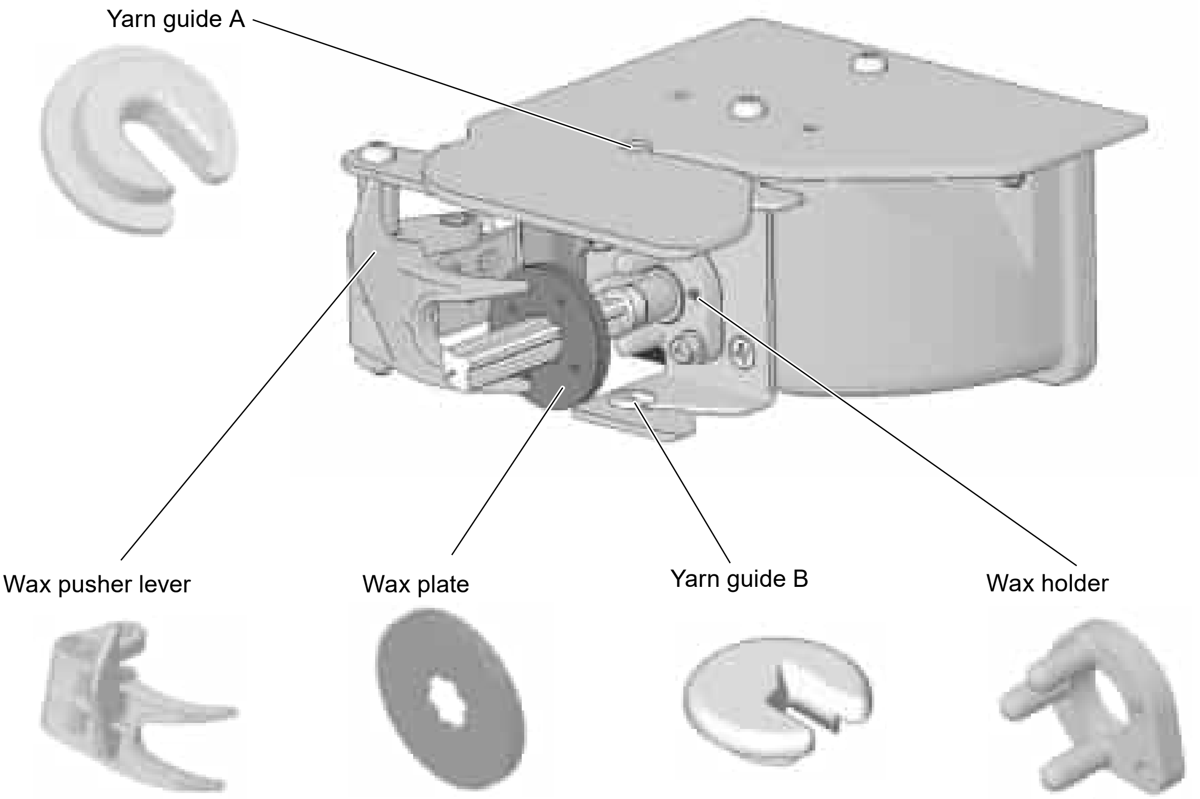
1. **Put your left index finger around the hose.**
2. **Remove the hose by pulling straight toward the left side.**
   The hose can be removed from the joint.

* When reconnecting the hose to the joint, insert the hose all the way in so that it does not come off.
In addition, if the hose comes off due to deterioration or being warped, replace the hose with a new one.


Blast hose
Clearer
Pull the hose with your index finger to remove.

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.


Yarn guide A
Wax pusher lever
Wax plate
Yarn guide B
Wax holder

Chapter

4Da PLC21

Introduction

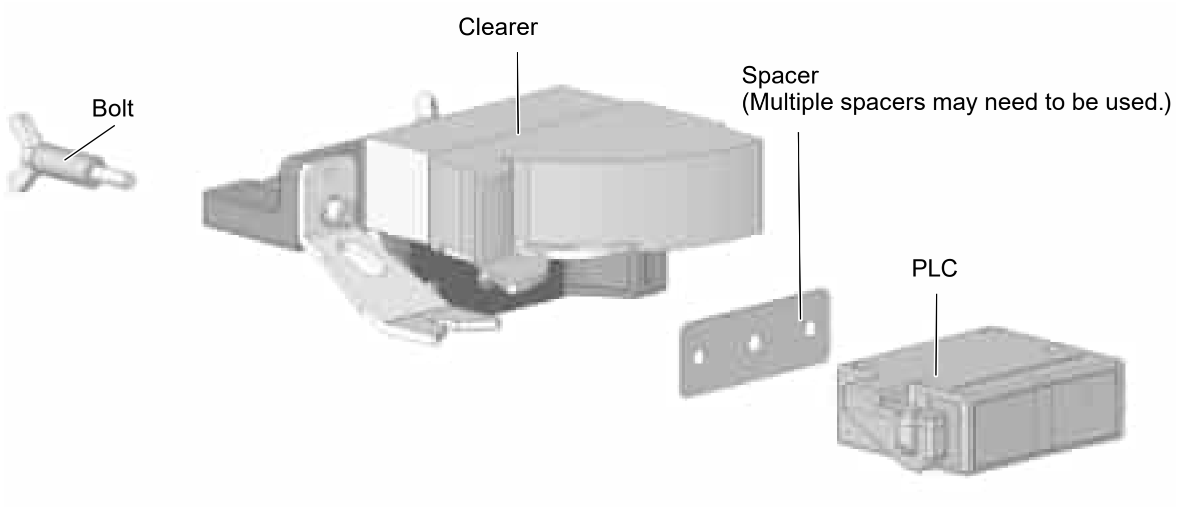
CAUTION

LS100 and LS200 cannot be mixed on a single machine.
If they are intermixed, it will not be possible to achieve sufficient fixed yarn length precision.

Sec 1 Adjustment Standard

1-1 Mounting Position

The mounting position for the PLC21 is adjusted using spacers.
Suitable spacers are already fitted at the time of shipment.
Change and adjust the spacer fittings when changing the yarn path, such as during the replacement of a clearer, for example. (Refer to Chapter 4Da, 1-2)



[Spacer set]
Individual spacer sets are available to fit your clearer head.

Set	Head type	Clearer maker
0.8 mm x 1 0.3 mm x 2	iMH-C15, 20, 30 iMH-C15/F30, 20/F30, 30/F30 iMH-C15/F30+PP, 20/F30+PP	USTER
0.8 mm x 1 0.3 mm x 2	i-QON A: MU15, 20 i-QON AX: MU15, 20 i-QON A XP: MU15, 20	PREMIER
1.2 mm x 1 0.3 mm x 2	TK: YM-ZENIT (F, FP, N, FN, FPN)	LOEPFE
0.7 mm x 1 0.3 mm x 2	TK: YM-ZENIT+ (D, DF, DFP, DN, DFN, DFPN)	LOEPFE
0.7 mm x 1 0.3 mm x 2	SU-12, 18, 24, 30, 33, 35, 37 (With MICRO-EYE)	KEISOKKI

1-2 Spacer Selection & Replacement

Use the adjustment jig included to first select the correct spacer and then refit it.

* Use the measurement jig included to measure the thickness of the spacer using the procedure below.

1. **Remove only the PLC, leaving the clearer still mounted, and then set the yarn to be used from the bobbin to the take-up tube.**

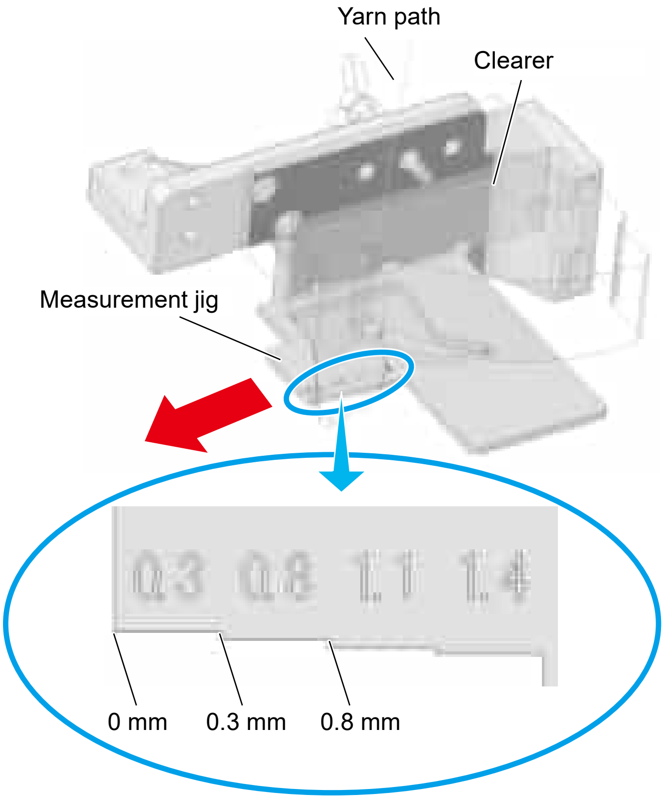
2. **Press the measurement jig up against the mounting side for the PLC. Adjust it following the direction of the arrow in the picture on the right, and check the position where the yarn touches.**

3. **Perform the above measurement over one span (12 winding units).**

   The most common value is the right thickness for the spacer.

   * Fit the spacer with the same thickness onto all the winding units.

4. **Adjust the spacers included to the right thickness and fit them onto all the winding units.**

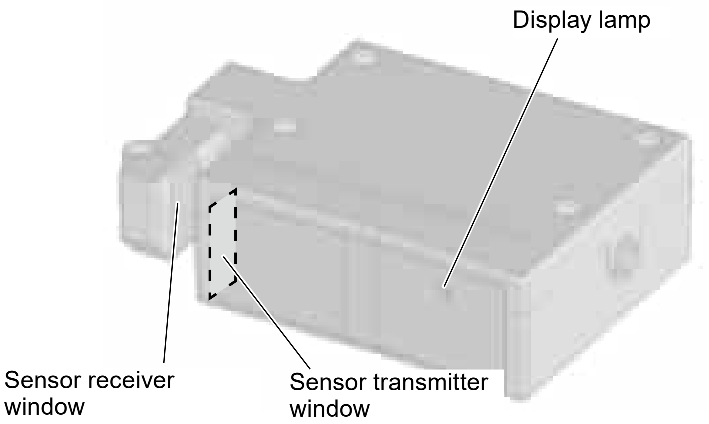


Sec 2 Maintenance

2-1 Inspection

Inspect and check the display lamp.

Green	Normal operation
Red	The following lists the probable causes. • Not enough light passes through due to a dirty sensor receiver or transmitter window. * Clean the window(s) following the procedure in Section 2-2. • Outside the specification range • Faulty PLC21



2-2 Cleaning

Using one of the following methods, clean the cotton honey or any other buildup on the sensor receiver or transmitter window.

- **Wipe clean with a dry, soft cloth.**

  or
- **Wipe with a cloth or cotton swab moistened with water, or water diluted with mild detergent.**

Frequency

Once a month, or when the red lamp lights up

CAUTION

- If there is a scratch on the window, it may not measure correctly. Only clean the window using the methods mentioned above.
- Do not use alcohol based agents (thinner, benzine, etc.).
- Do not disassemble the PLC. Otherwise the PLC may become faulty or damaged.

Chapter 4Ea Suction Mouth

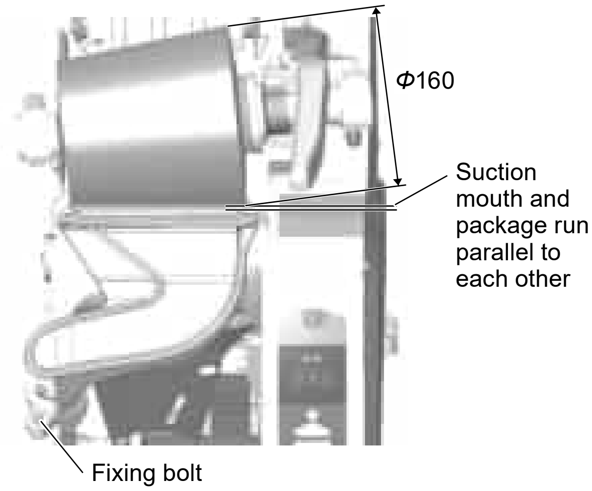
Sec 1 Adjustment Standard

1-1 Parallelism

1. **Attach the package on the side with the larger diameter (dia. 160).**
2. **Loosen the bolt that fixes the suction mouth and adjust the suction mouth so that it runs parallel with the Φ160 mm size package.**

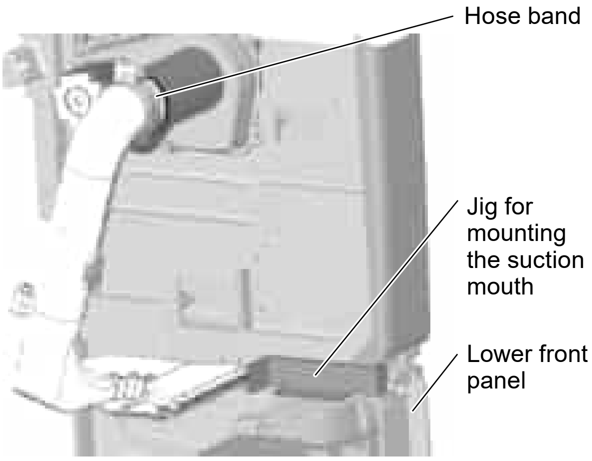
   * The tightening torque for the fixing bolt is between 20.0 and 25.0 N•m.

   * To change the angle, always adjust the home position of the suction mouth.



1-2 Arm Home Position

- **After leveling the angle of the suction mouth, adjust the home position.**
  If the suction mouth does not run parallel (not level) with the package, the home position cannot be adjusted correctly.

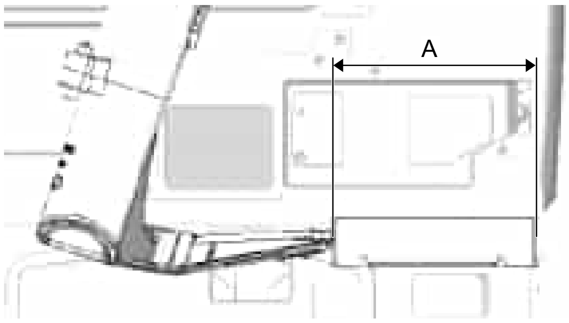


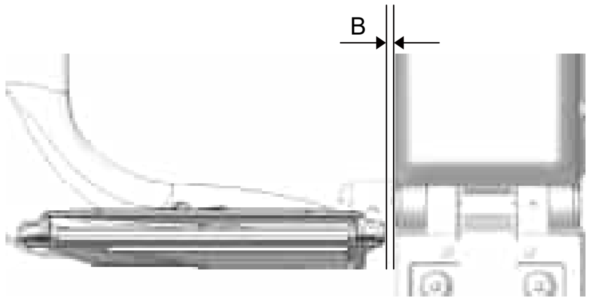
Perform the adjustment while the power is turned on.
If the mouth has been removed, refer to section 2-1 for directions on how to mount the suction mouth.

1. **Remove the lower front panel.**
2. **Perform the "Suction mouth adjustment" procedure, mount the arm, put it in the home position and fix it in place using the VOS maintenance screen settings.**
   (Refer to Chapter 3)
3. **Check the position using the suction mouth mounting jig, and loosen the hose band to make adjustments.**

   * Adjustment the standard value for the arm home position
   A = 124.3 ± 0.5 mm (forward and backward)
   B = 4 ± 1 mm (right and left)

   * As a general guideline, the tightening torque for the hose band is between 3.6 and 4.1 N•m.

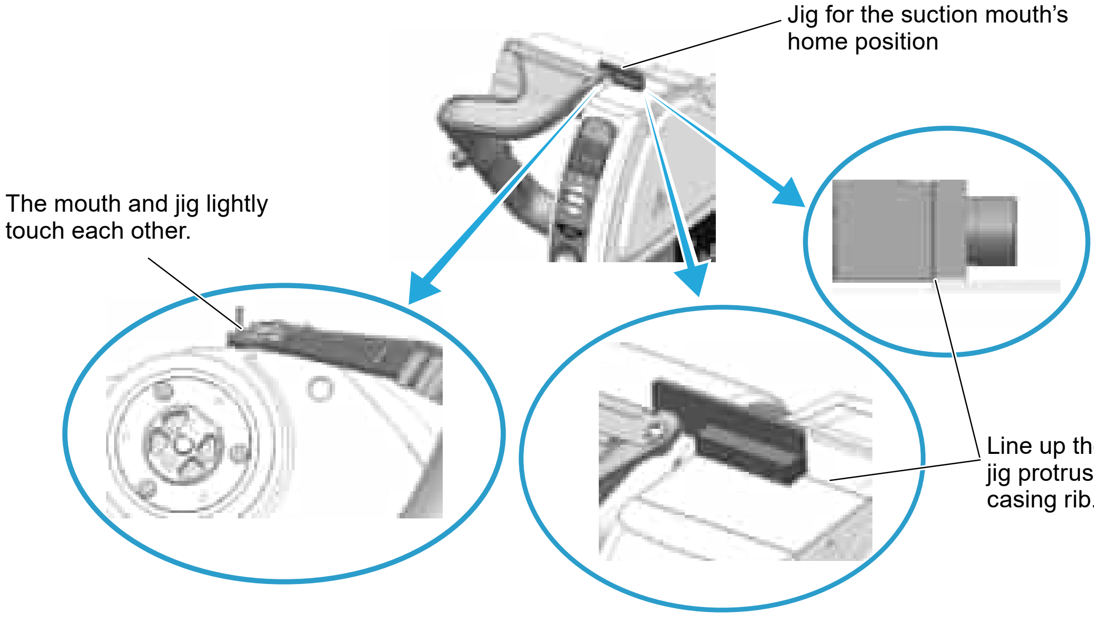




4. **Set the arm in the home correction position, and adjust or correct the home position using the jig.**
Press the alarm reset button (middle), and adjust the arm position using the top and bottom alarm reset buttons so that the arm moves to the home correction position and lightly touches the jig for correcting the home position.

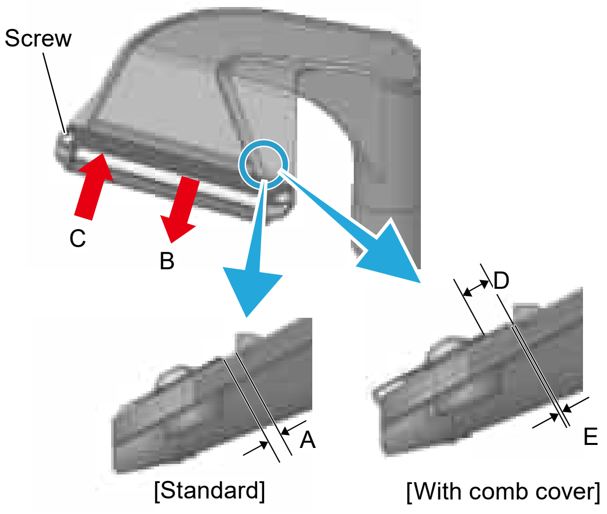
Press down the alarm reset button (middle) for one second to return the arm to the standby position.

* The arm's standard home position is ± 0.5 mm from the jig.


Jig for the suction mouth's home position
The mouth and jig lightly touch each other.
Line up the front of the jig protrusion with the casing rib.

1-3 Comb

Loosen the screws and adjust.
When there are a lot of "Yarn End Find Errors," the problem can sometimes be fixed or improved by adjusting the comb.



- **Standard position setting**

Mount so that it fulfils the following dimensions.

Standard specification	A = 3 ± 0.5 mm
Comb cover specification	D (Comb cover) = 5 ± 0.5 mm E (Comb) = 0.5 ± 0.5 mm
CF comb specification	A = 3.5 ± 0.5 mm

- **When using yarn that does not come out the end smoothly**

Pull out towards you in the direction indicated by "B," and fix the position.

- **When frequent double yarn end finding occurs with the yarn**

Push back all the way in the direction indicated by "C," and fix the position.

1-4 VOS Settings

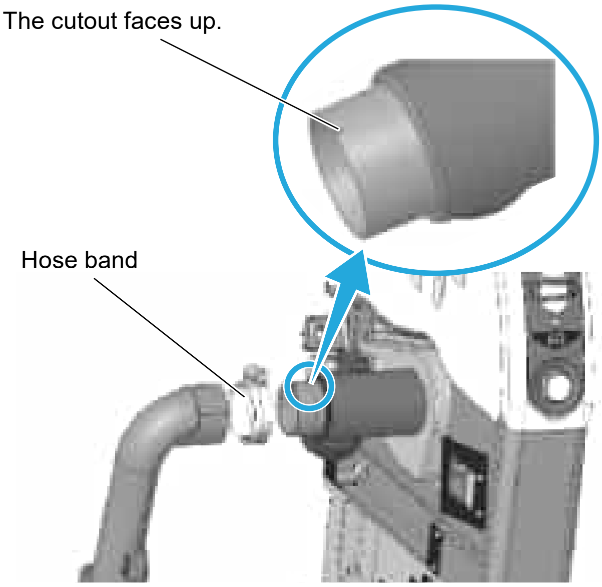
The VOS settings are listed below. Change the setting conditions when necessary.

Suction Mouth Proximity	For standard use, select "STD" (Value range: -10 to STD to +10) * Set a value closer to +10 to adjust the suction mouth position closer to the package, and set a value closer to -10 to adjust the suction mouth position further away from the package.
Suction mouth motion mode	Normally set to mode 1, but you can select from modes 1, 2 or 3
Suction force for mouth	Normally set to STD, but you can select any level from -5 to STD * To reduce the suction force, set the level closer to -5.

Sec 2 Maintenance

2-1 Mouth Attachment

Mount so that the cutout on the shaft is on top and the arm faces down.
Always adjust the home position for the arm (refer to 1-2).
The tightening torque for the hose band is between 3.6 and 4.1 N•m.

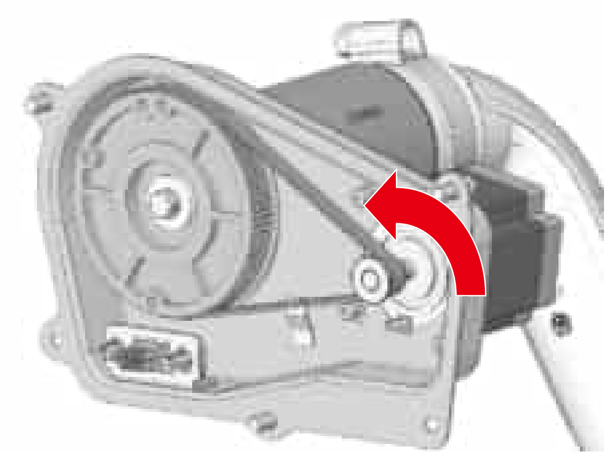


2-2 Tightening the Timing Belt

Turn and adjust the motor.

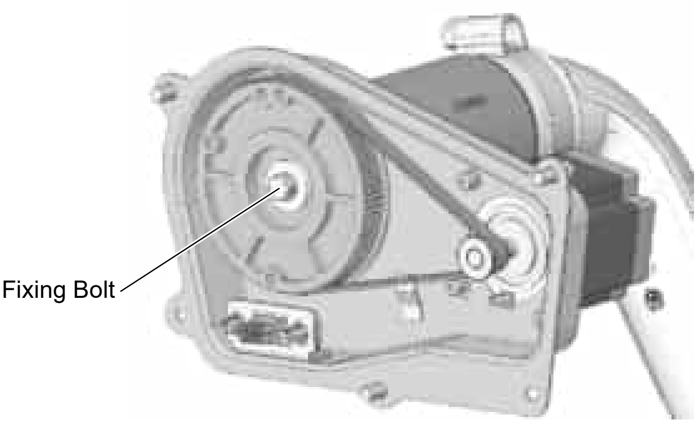
CAUTION

Ensure that the belt is not too slack or too taut. (Recommended tension: 30.2 – 40.6 N)
Malfunctions could occur if the tension is out of the recommended range.



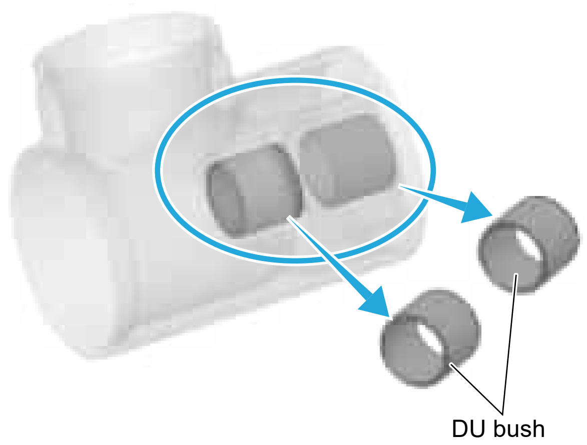
2-3 Pulley Attachment

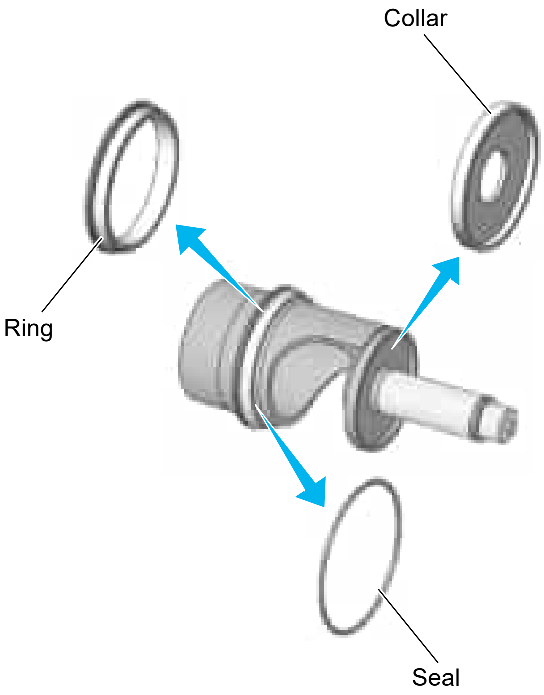
The tightening torque for the fixing bolt is between 16.0 and 18.0 N•m.

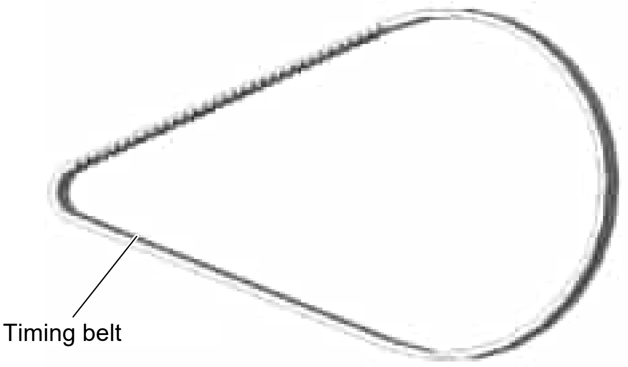


Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.




Collar
Ring
Seal

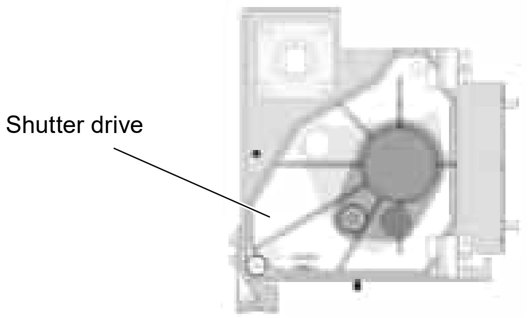

Timing belt

Chapter
4Fa Suction Shutter

Sec 1 Maintenance

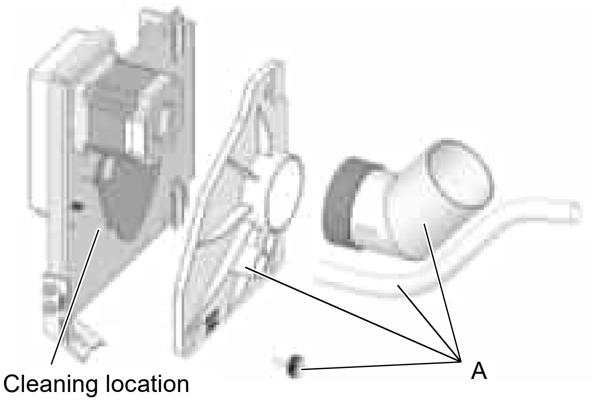
1-1 Inspection

Perform inspections once a week to check if cotton fly has built up in the shutter drive section.



1-2 Cleaning

Clean the shutter drive if EH alarm occurs due to cotton fly or yarn buildup.
Remove all the parts A indicated in the figure on the right, and take out any cotton fly or yarn waste.

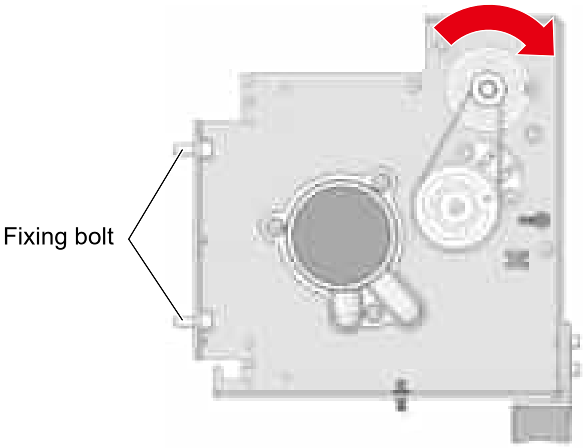


1-3 Tightening the Timing Belt

Turn and adjust the motor.

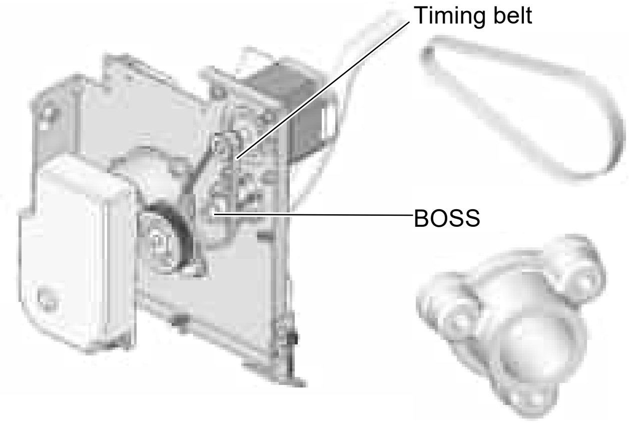
CAUTION

Ensure that the belt is not too slack or too taut. (Recommended tension: 30.2 – 40.6 N)
Malfunctions could occur if the tension is out of the recommended range.



Sec 2 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.



Chapter

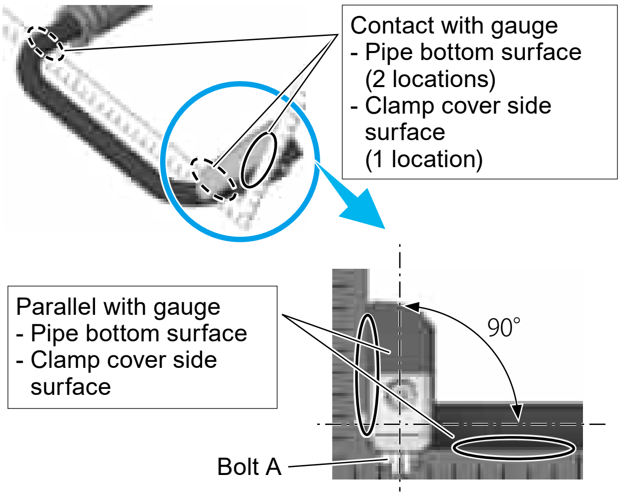
4Ga Re-tie Pipe

Sec 1 Adjustment standard

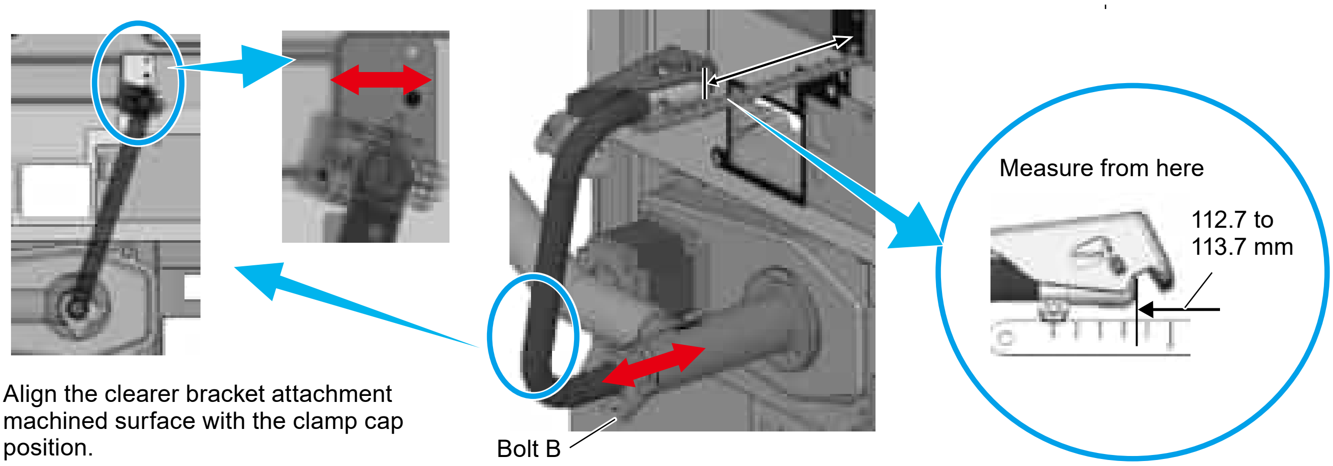
1-1 Clamp angle & position

1. **Align pipe in horizontal position and loosen bolt A.**
2. **Use an L shaped gauge to attach the clamp and pipe so they are perpendicular.**
3. **Remove the clearer bracket and loosen bolt B.**
4. **Place the gauge on the clearer bracket attachment machined surface and adjust so that the cap bottom end tip distance is between 112.7-113.7 mm.**

* Adjust the position of the pipe in the thrust direction.


Contact with gauge
- Pipe bottom surface
  (2 locations)
- Clamp cover side
  surface
  (1 location)

Parallel with gauge
- Pipe bottom surface
- Clamp cover side
  surface



Align the clearer bracket attachment machined surface with the clamp cap position.

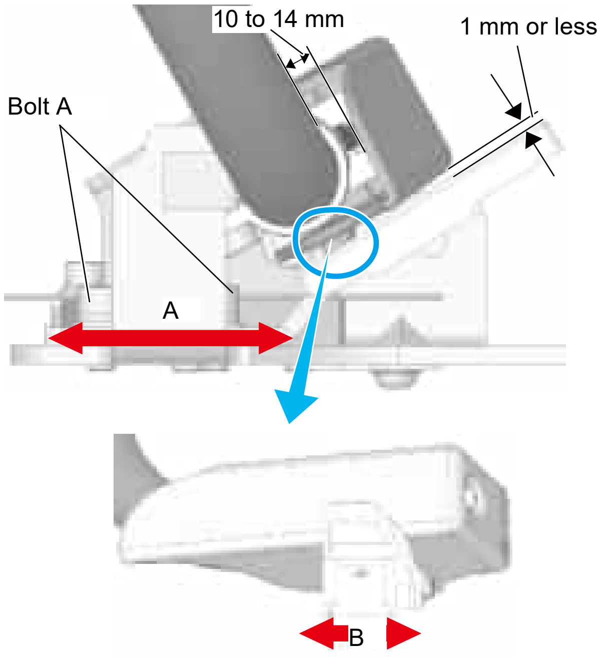
1-2 Opener cam clearance

When the retie pipe is positioned on the bottom

(Comes into contact with the home position stopper)

1. **Loosen bolt C, and adjust A as indicated in the figure so that the distance between the clamp cover and the opener cam on the lower side is always less than 1 mm (so that there is no contact between them during operation and the clamp assembly opens).**
2. **Adjust B as indicated in the figure so that the distance between the clamp cover and the pipe is always between 10 and 14 mm.**

* This adjustment is to ensure that no unnecessary force is applied to the clamp cover.

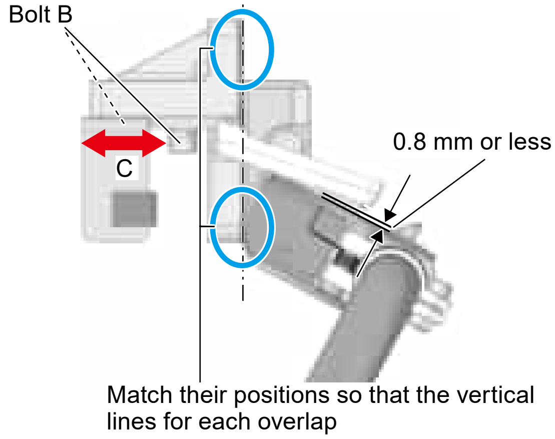


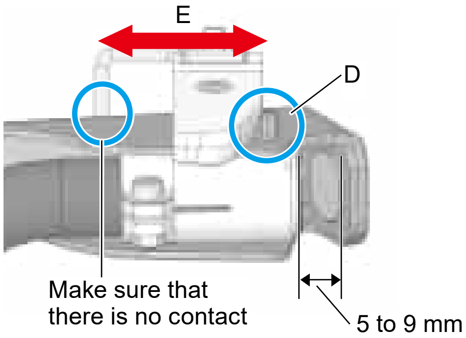
When the retie pipe is positioned on the top

1. **Move the pipe manually so that the attachment side of the clearer is in line (vertically) with the edge of the clamp cover.**
2. **Loosen bolt B, and adjust C as indicated in the figure so that the distance between the clamp cover and the opener cam on the upper side is always less than 0.8 mm (so that there is no contact between them during operation and the clamp assembly opens).**
3. **Move the straight section of the opener cam so that it overlaps with the protruding section of the clamp cover (D).**

   * Ensure that the clamp cover does not come into contact with the upper end stopper.
4. **Adjust the opener cam (location E indicated in the figure) so that the clearance in front of the mouthpiece (between the front end of the mouthpiece and the disc) is always between 5 and 9 mm.**

   * This adjustment is to ensure that no unnecessary force is applied to the clamp cover.


Bolt B
C
0.8 mm or less
Match their positions so that the vertical lines for each overlap



CAUTION

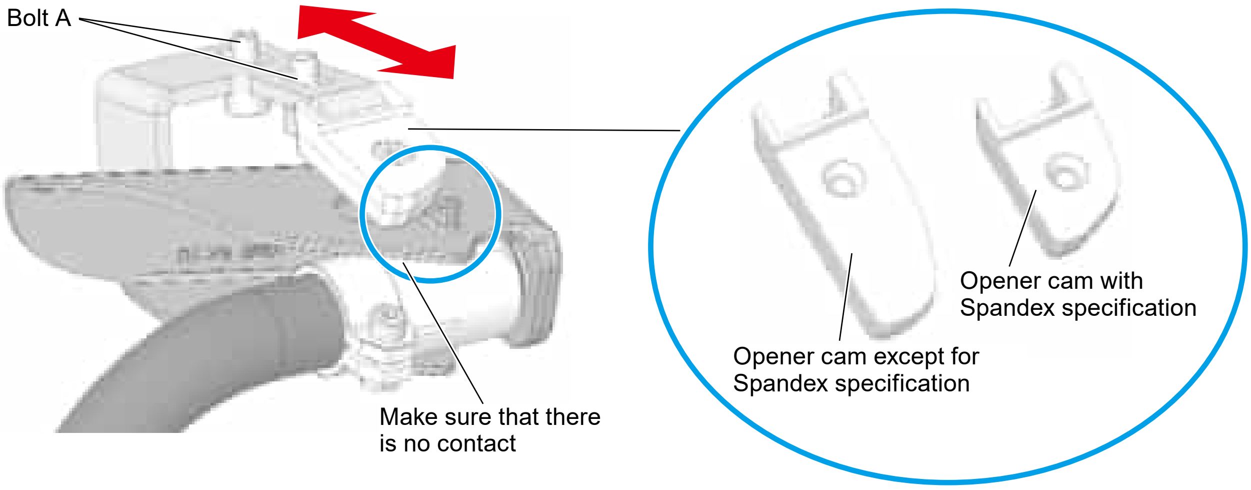
If the clamp cover and the opener cam come into contact with each other, any unnecessary or excess force applied to the clamp cover can cause damage to parts, opening malfunction or pipe malfunction. On the other hand, if the gap is too big, the opening operation may not perform correctly and similarly, cause damage to parts or opening malfunction.

1-3 Spandex specification

For specifications other than stretch air splicer (SAS) & disk splicer

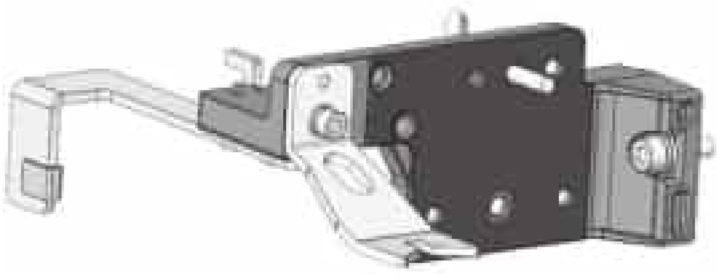
After adjusting the clamp and opener cam, check to make sure that they do not come into contact with each other at the temporary stop position during the splicing operation.
If they do come into contact with each other, loosen bolt A and adjust the bracket position so that they do not touch. Thereafter, ensure that the opener cam space is appropriate.

CAUTION Always replace the opener cam with a short type cam.


Bolt A
Make sure that there is no contact
Opener cam with Spandex specification
Opener cam except for Spandex specification

For stretch air splicer (SAS) & disk splicer specifications

Because there is no opener cam attached, there is no adjustment location.



1-4 VOS settings

The VOS settings are listed below. Change the setting conditions when necessary.

RetiePipeKinkPrevention	Select from: OFF / Level1 / Level2

[For stretch air splicer (SAS) & disk splicer specifications]

Re-tie pipe top opener cam	Select “Without”
Lower yarn tension operation * Splicer type: When Spandex is selected	Select from: OFF / +1 / +2 / +3

Sec 2 Maintenance

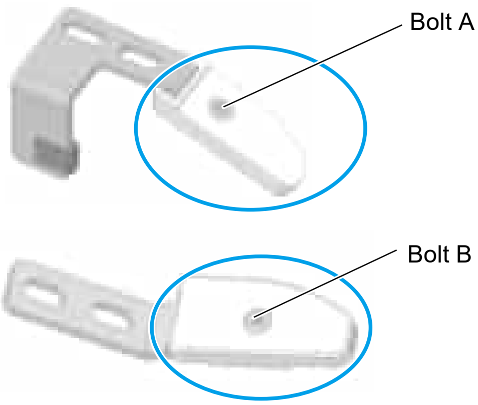
2-1 Mounting the opener cam

If the parts indicated in the figure are worn causing a failure or problem, replace the worn part or parts with a new one.

* The tightening torque for bolts A and B is between 1.1 and 1.4 N•m.

CAUTION

Apply locking adhesive to bolts A and B on the opener cam when mounting.

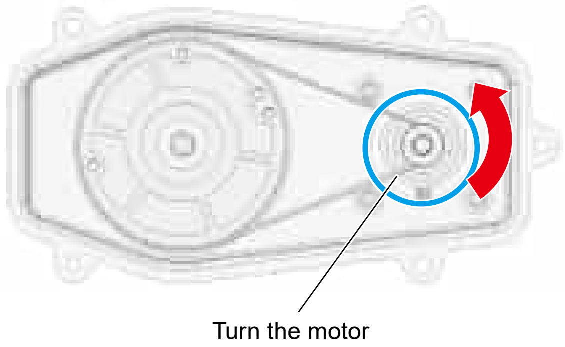


2-2 Tightening the timing belt

Turn and adjust the motor.

CAUTION

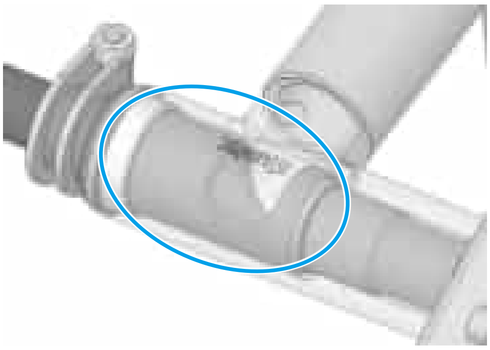
Ensure that the belt is not too slack or too taut. (Recommended tension: 30.2 – 40.6 N)
Malfunctions could occur if the tension is out of the recommended range.



2-3 Shaft & boss cleaning

If any cotton fly is clogging the shaft or boss, it can obstruct operation.
Raise the pipe so it is horizontal while the unit operation switch is pulled. If the pipe does not lower when a 600 g weight is hung from the clamp assembly, then disassemble and clean.

Frequency	Guideline
Every 6 months	Remove any cotton fly that is clogged (Only winding units noted above)

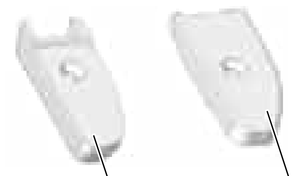


CAUTION

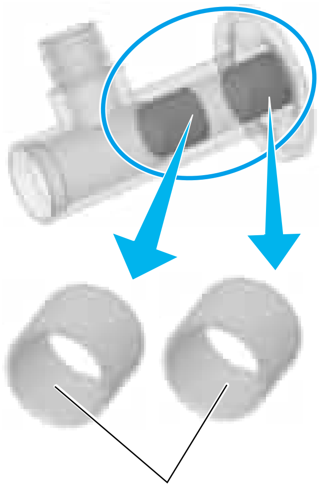
Set the sheet (felt) when cleaning so that it does not break apart.

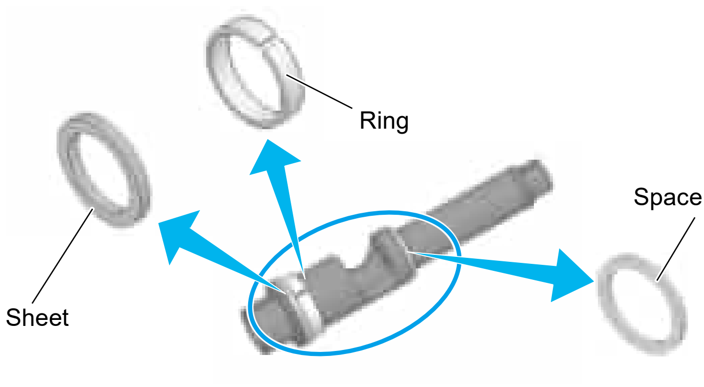
Sec 3 Consumables

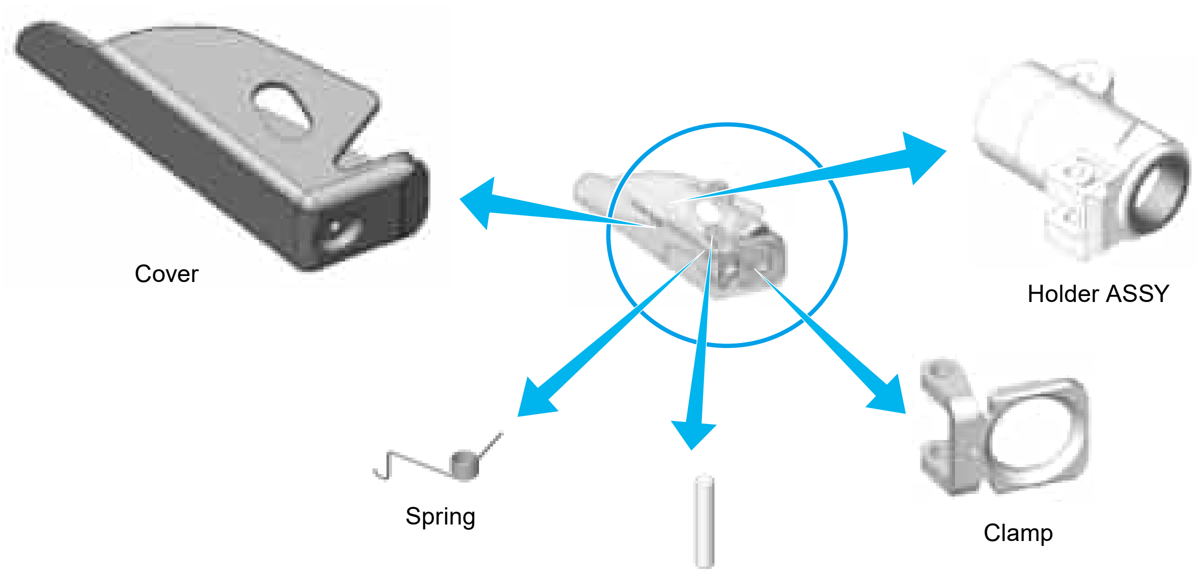
If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.


Upper opener cam
Lower opener cam

Timing belt

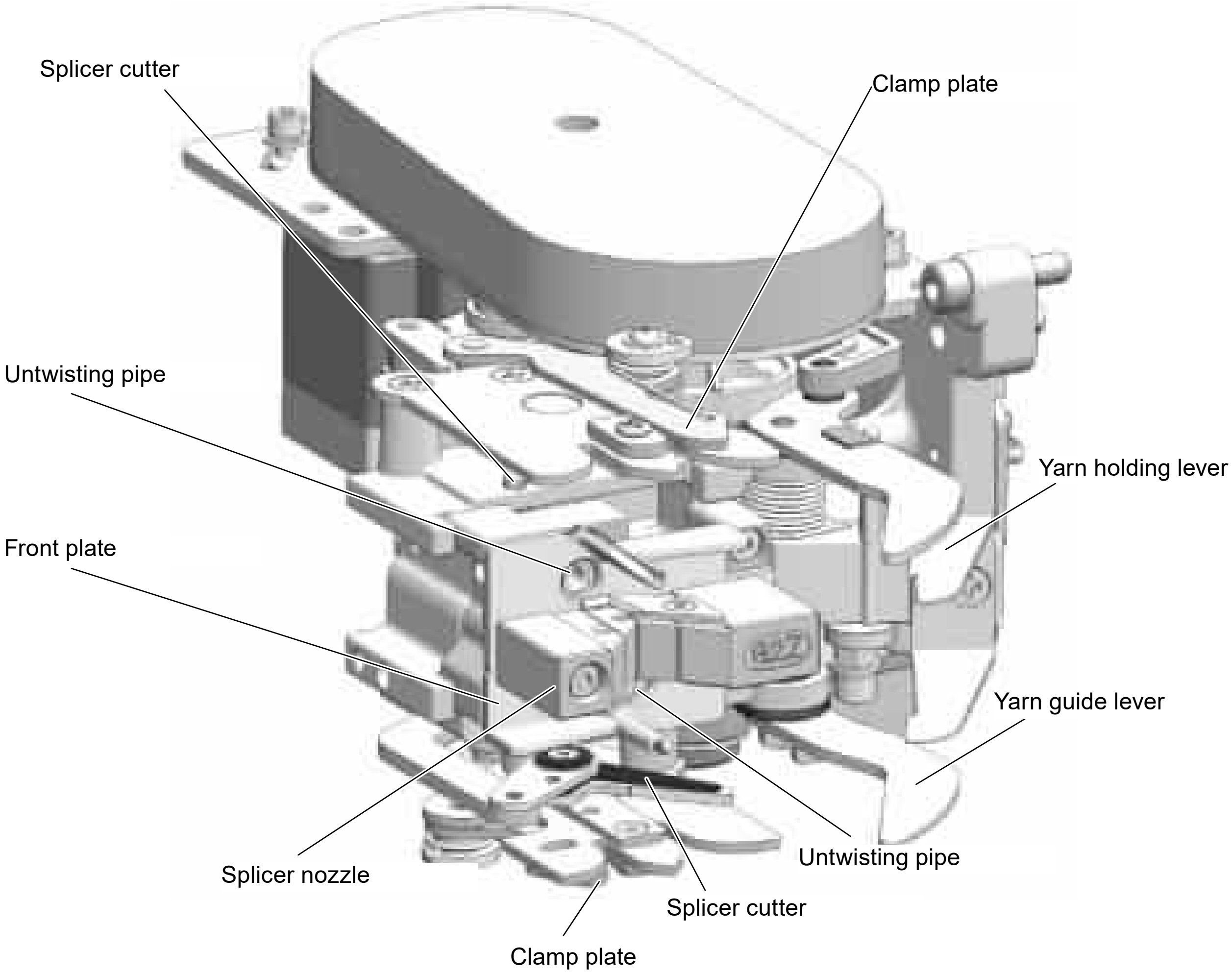



Ring
Spacer
Sheet


Cover
Holder ASSY
Spring
Clamp
Shaft

Air Splicer

Names of Each Part


Splicer cutter
Clamp plate
Untwisting pipe
Yarn holding lever
Front plate
Yarn guide lever
Untwisting pipe
Splicer nozzle
Splicer cutter
Clamp plate

Sec 1 Adjustment Standard

1-1 Compressed Air

Make the following air pressure adjustments for the untwisting (P1 pipe) and the splicing (P2 pipe).

P1 pipe	0.65 MPa (Fixed)
P2 pipe	0.3 to 0.65 MPa (The P2 pipe air pressure varies depending on the yarn count and type)

- **Adjustment guideline for the P2 pipe air pressure**

- If the yarn breaks from the blasting operation due to high air pressure, lower the air pressure for splicing.
- If the splice strength is inadequate (loose), raise the air pressure.
- If the splice strength is inadequate (breaks or too thin), lower the air pressure.

* When lowering the air pressure, lower it to below the target value, then set the value so that it increases.

* Refer to Chapter 2 for details on the air pressure adjustment method.

CAUTION

After adjustment, ensure that the splicing strength and yarn appearance are appropriate.

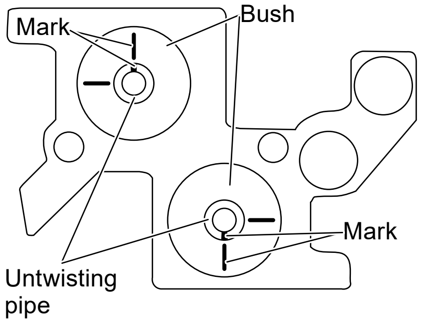
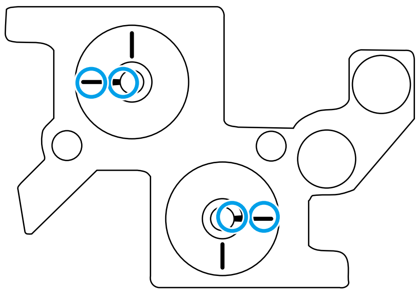
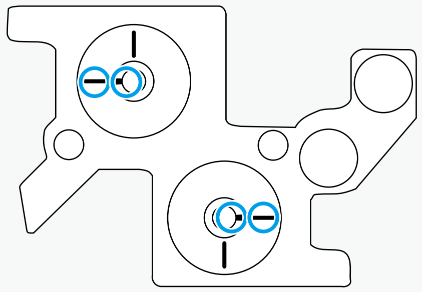
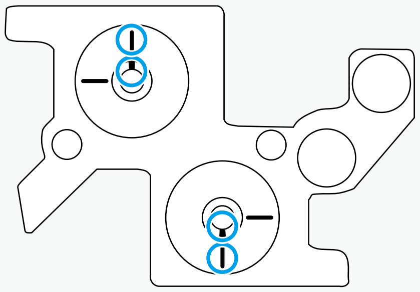
1-2 Untwisting Pipe

To obtain good splices, adjust the untwisting pipe to optimize the untwisting performance. If the untwisting performance is inadequate, the splice strength or elongation retention rates will be reduced.
If the S-twist or Z-twist has changed, make the necessary adjustments as well.

Untwisted Pipe Setting & Press Marks

There are two press marks on the bushing side and one on the untwisting pipe side. Match the settings with the untwisting direction of the yarn, and align the untwisting pipe mark with the bushing mark, as illustrated in the diagram below.

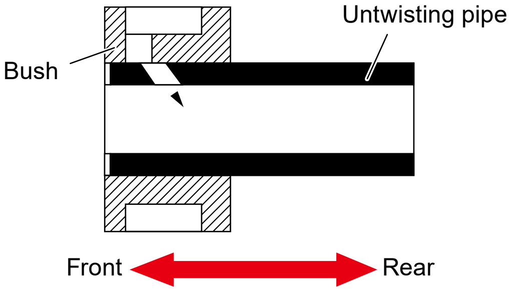
* The position of the mark varies depending on the type of untwisting pipe: pipe for standard yarn or special untwisting pipe (with a colored end).

	For Z-twist yarns	For S-twist yarns
Untwisting pipe for normal yarns		
Special untwisting pipe (with colored end)		

Untwisting Performance Adjustment

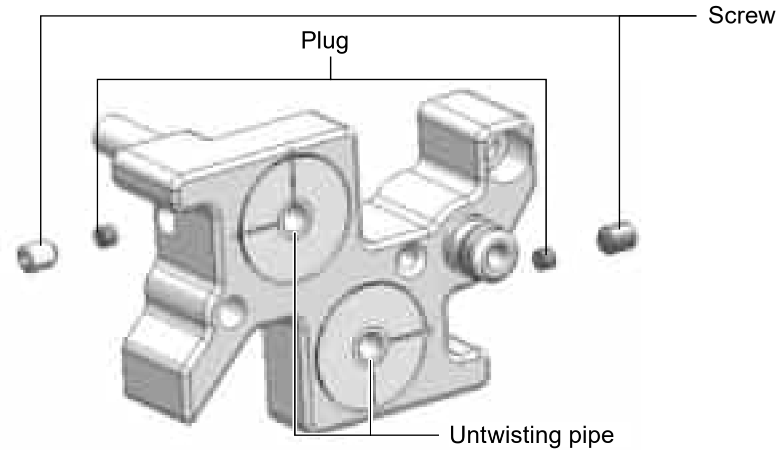
Adjust by moving the untwisting pipe forward or backward using the adjustment gauge. (Adjustments must be made in increments of 0.1 mm)

- If the section to be untwisted is long and the ends are tangled and too fine, adjust and move it inward.
- If the section to be untwisted is short, adjust and move it outward.



CAUTION

The untwisting pipe is fixed in place by inserting the plug first and then screwing in the screw as shown in the diagram below. Loosen the screw prior to making the untwisting pipe adjustment.

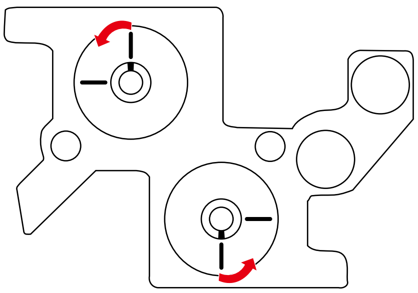
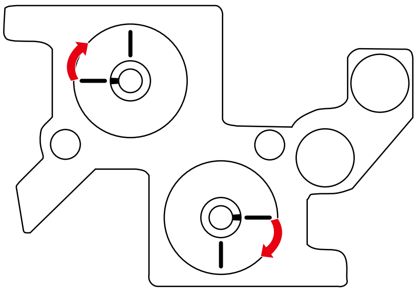
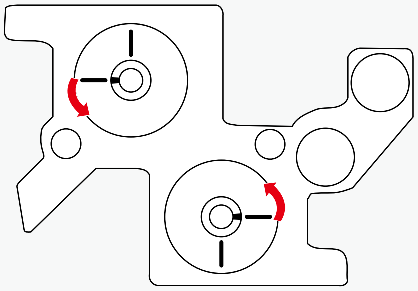
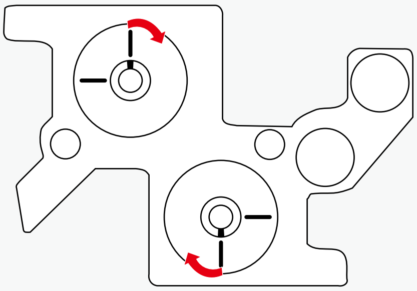


Since the untwisting pipe is ceramic, over-tightening the fixing screw may cause the pipe to fracture or break. As a general guideline, the tightening torque for the fixing screws is between 0.2 and 0.3 N•m.

When the “Untwisting Performance Adjustment” is Inadequate

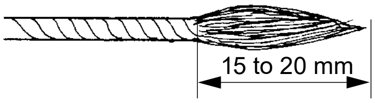
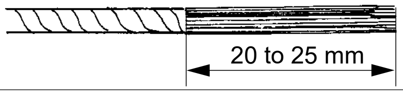
For both the S-twist and Z-twist yarns, the more the yarn is twisted, the more the untwisting pipe should be turned. The forward or rear position of the untwisting pipe must also be re-adjusted. The adjustments are made in increments of 3°.

[Untwisting pipe setting and turning direction]

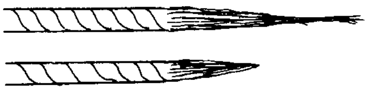
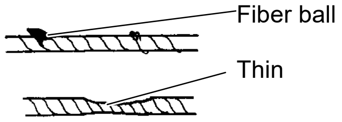
	For Z-twist yarns [Counterclockwise]	**For S-twist yarns [Clockwise]**
Untwisting pipe for normal yarns		
Special untwisting pipe		

Condition of the Untwisted Yarn

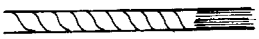
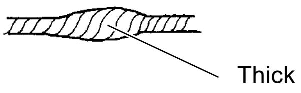
- **Normal**

Short fibers (51 mm or less)  	Brush tip form	Splice has satisfactory appearance and strength
Long fibers (over 51 mm)  	Loose fibers in parallel (moderate bulkiness)	

- **When the untwisting pipe is set forward from the normal position or is over-twisted**

Short fibers 	- No bulkiness - Blown fibers are tangled at end - Fibers are overblown	Large dispersion of strength 
Long fibers 	- No bulkiness - Some of the fibers are tangled	Large dispersion of strength

- **When the untwisting pipe is set backward from the normal position**

Short fibers and long fibers 	Untwisted part is short	Low strength due to pull-out 

1-3 Yarn Holding Lever

Yarn Holding Lever Setting

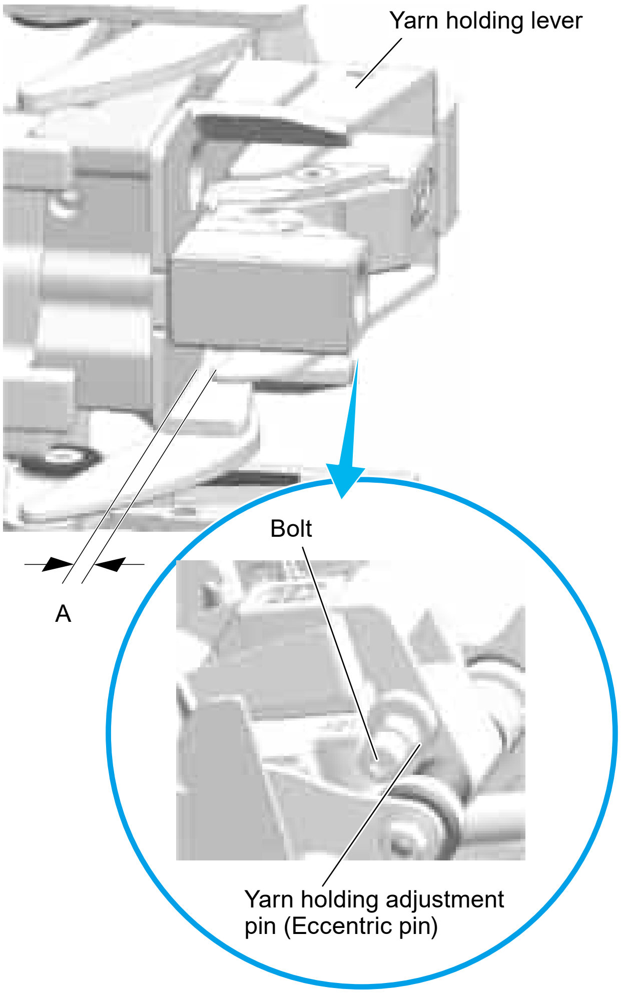
1. **Stop the splicer at the stage illustrated in the diagram on the right using the unit check mode.**

   * Refer to Chapter 3 for details on the check mode.

2. **Turn the yarn holding pin (eccentric pin) to adjust the distance (“A” shown in diagram on right) between the end of the yarn holding lever on the bottom side and the front plate.**

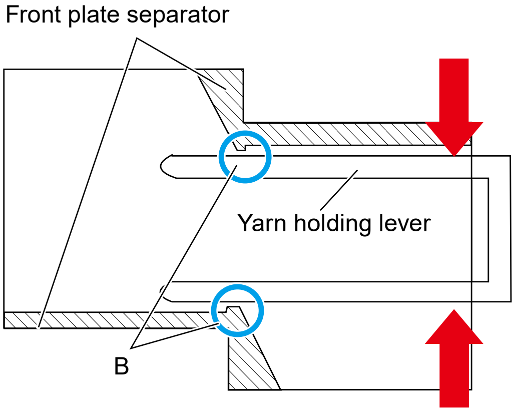
   [Adjustment range]

Yarn holding lever	Adjustment dimension [A] (mm)
J2	1.5 to 2.5
J1, H	2.0 to 3.0
E, K	5.0 to 6.0


Yarn holding lever
A
Bolt
Yarn holding adjustment pin (Eccentric pin)

Yarn Holding Lever Width

Adjust the width of the yarn holding lever so that it fits in between the front plate separators. Leave about 0.5 mm of clearance so that there is no contact, as shown by the “B” points in the diagram on the right.
The area indicated by the arrows in the diagram is bent and adjusted. Do not bend at the front end.

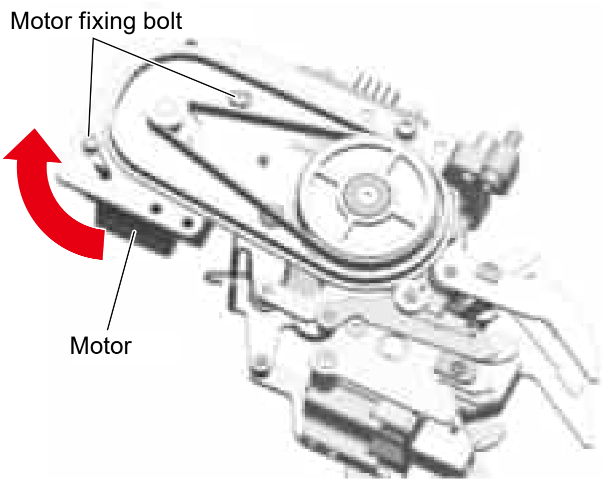

Front plate separator
Yarn holding lever
B

1-4 Tightening the Timing Belt

Turn and adjust the motor.

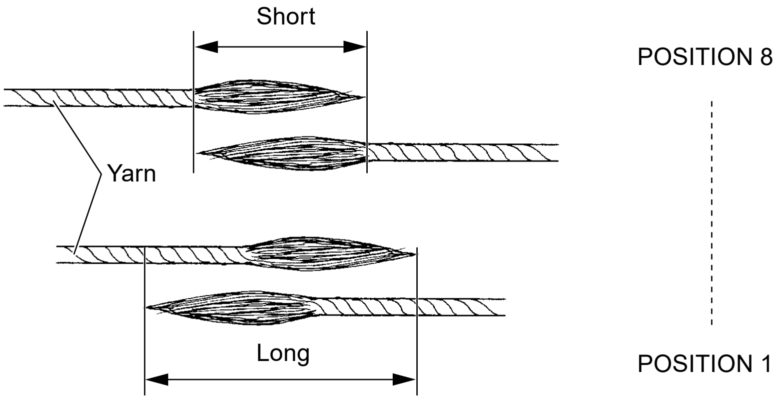
CAUTION

Ensure that the belt is not too slack or too taut. (Recommended tension: 30.2 – 40.6 N)
Malfunctions could occur if the tension is out of the recommended range.



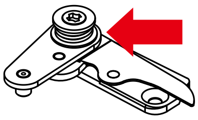
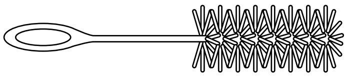
1-5 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Yarn Joining Device	Select “Air”
Splicer Nozzle Type	Select the splicer nozzle being used
Yarn Type for Splicing	Select the appropriate setting from : STD / SPANDEX / WOOLEN
Splice Length	Adjustment of overlapping splice length **[Adjustment guideline]** Select from Position 1 to 8 - If the splice is too long or too thick, set a position closer to “Position 8” - If the splice is thin or the strength is inadequate, set a position closer to “Position 1” 
Splicer Cutter Type	Select “Standard Cutter" or “Clamp Cutter”
Untwisting Time [A]	Set the compressed air discharge time for untwisting
Splicing Time [C]	Set the compressed air discharge time for splicing

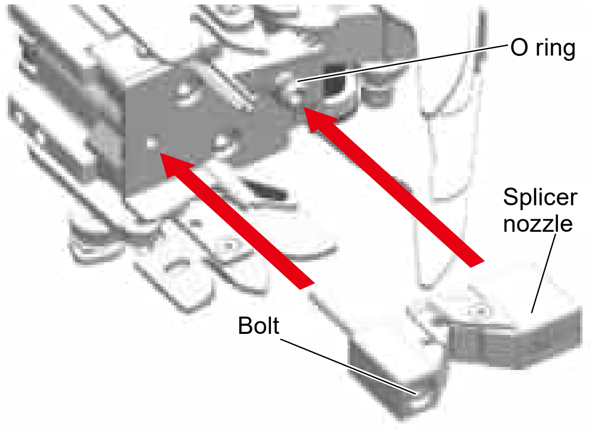
Sec 2 Maintenance

2-1 Inspection

Frequency	Item	Guideline
Daily	Remove cotton fly from the splicer	Clean with air gun
Weekly	Splice check	- Check splice for appearance and strength (Pull gauge) - Check the cutter sharpness (visual check) - Check for any air discharge errors or faults - Check whether or not the air is continuing to discharge or is not discharging at all (visual and sound check, as well as splicing performance check)
When the yarn process is changed	Splice check (P2 pressure, splice length)	Check splice for appearance and strength (Pull gauge)
Every 3 months	Splicer cutter (clamp cutter specs only)	After removing the cotton fly from the cutter, lubricate the axis (blade lubrication not required) * ISO VG10 (Bearing oil) 
Every 6 months	Splicer	Remove the splicer and clean (use Cartridge attaching/ removing wrench) * In particular, remove the cotton fly stuck to the cam surface and the bearings.
Yearly	Remove dirt and stains from inside the untwisting pipe.	Clean with cleaning brush 

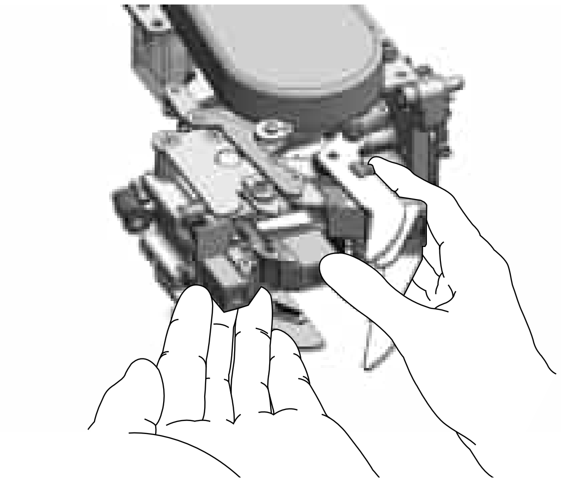
2-2 Precaution When Mounting Splicer Nozzle

1. **Fit the splicer nozzle on the pipe with the O-ring, and insert it all the way to the back of the pipe.**



* When attaching the splicer nozzle, securely push in with the thumb of your right hand on the stamped portion. Use your left hand only to lightly support the nozzle.

* If insertion is difficult, apply lithium-based grease to the O-ring.



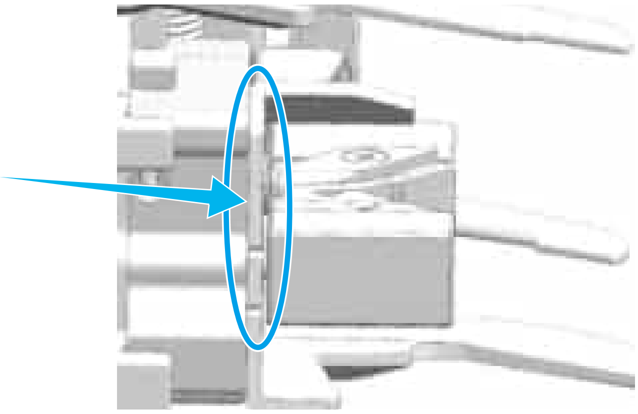
CAUTION

Do not strike with a hammer or screwdriver handle when inserting the splicer nozzle. Impacts from such strikes may damage the ceramic.

2. **Tighten the bolt.**

CAUTION

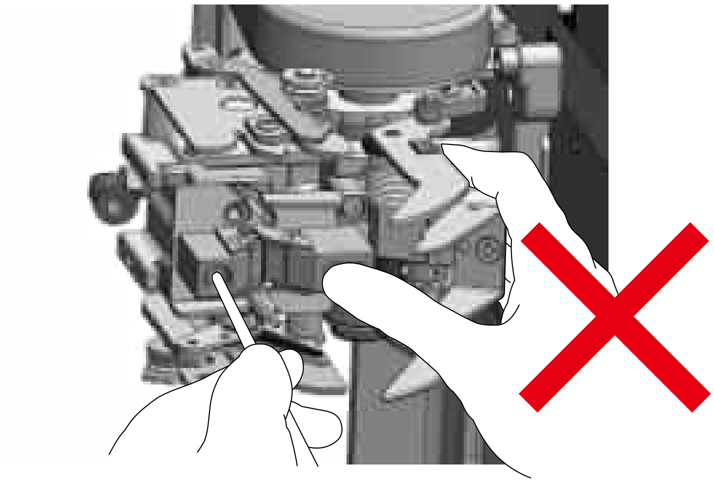
- Do not tighten the bolt if the splicer nozzle does not insert all the way to the back of the pipe (when there is a 1 mm gap or greater between the front plate and the splicer nozzle). The ceramic may fracture or break.
- If there is a gap of 0.5 mm or more even after securely pushing the splicer nozzle in, check to see if there are any abnormalities on the cassette side, and if any deformation or damage to the cassette is found, replace it.



* After tightening the bolt, the sides of the nozzle may rise slightly, but this is not a problem.

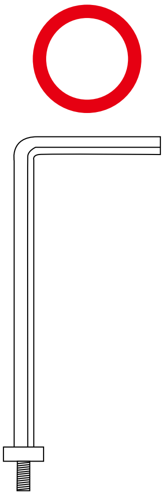
CAUTION

Do not tighten the bolt while pushing on the splicer nozzle.
Doing so will place load on the splicer nozzle, which may damage the ceramic.

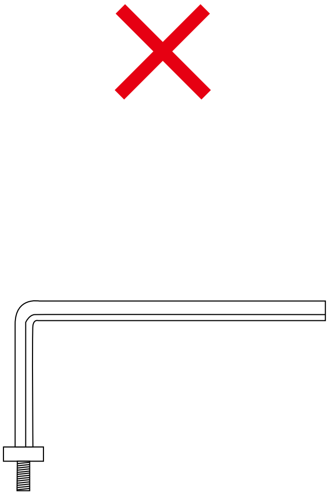


CAUTION

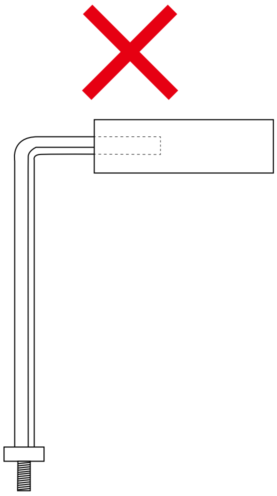
- The tightening torque for the splicer nozzle is between 1.7 and 2.1 N•m.
- If tightened too strongly, the ceramic may break and the threads may be stripped. Use an L-shaped hex wrench and tighten while holding the shorter end of the wrench to prevent applying excessive torque. Do not hold the long end of the wrench while tightening or use a T-shaped wrench.



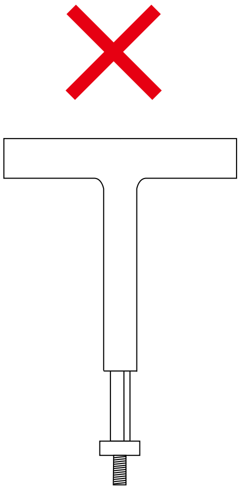
Hold by the short end



Hold by the long end



Tighten using a pipe or other extension



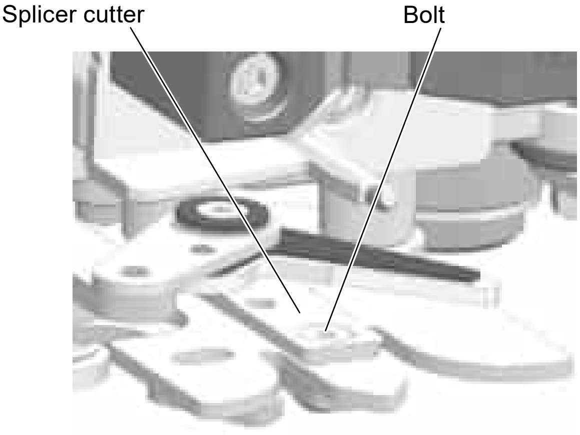
T-shaped wrench

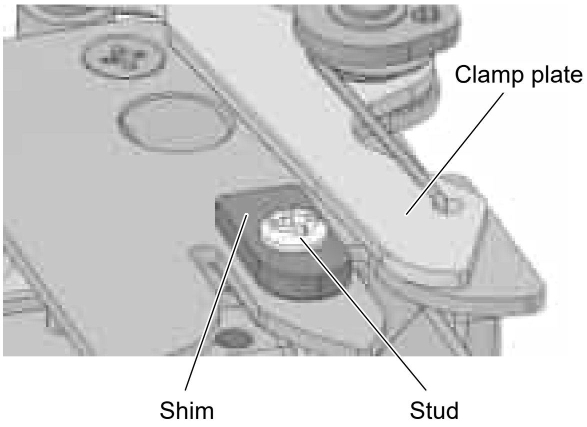
2-3 Precaution When Mounting Splicer Cutter

There are two splicer cutters, an upper and a lower.
(Lower shown on the right)

CAUTION

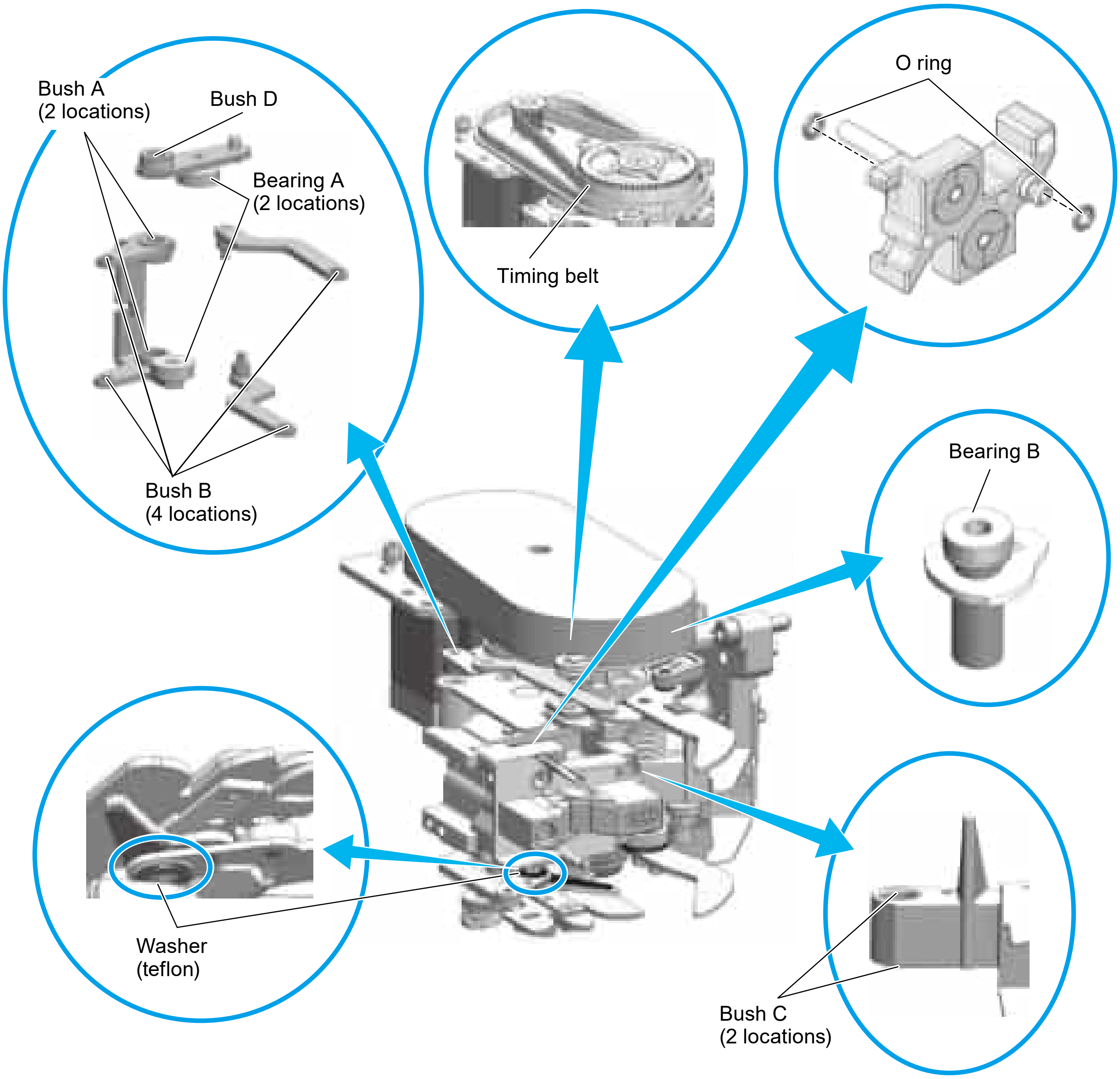
- Apply locking adhesive to the bolt before mounting the splicer cutter.
- Since the splicer cutter is ceramic, over-tightening the fixing bolt may cause the cutter to fracture or break.
  As a general guideline, the tightening torque for the bolt is between 0.2 and 0.3 N•m.
- The tightening torque for the stud is between 0.27 and 0.33 N•m.
- Attach the stud while there is still locking adhesive remaining on the bolt. Check that the shim moves along with the clamp plate after the stud is attached and the locking adhesive has dried.
- Be sure not to touch the splicer cutter as it can cause injury.



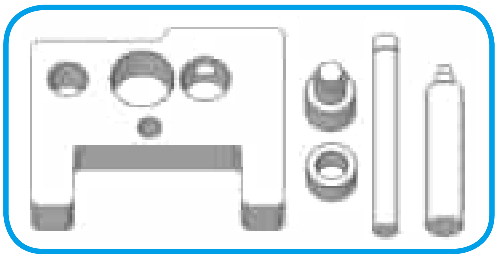


Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.

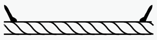
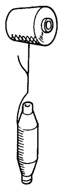

Bush A
(2 locations)
Bush D
Bearing A
(2 locations)
Bush B
(4 locations)
Timing belt
O ring
Bearing B
Washer
(teflon)
Bush C
(2 locations)

* For replacement of bush A, B, or D, the following replacement jigs are sold by Murata Parts Sales Ltd. Contact Murata Parts Sales Ltd. for details.



Sec 4 Problems When Splicing

4-1 Problems & Countermeasures

Problem	Cause	Countermeasures
Frequent splicing error	The settingi air pressure for Pipe P1 or pipe P2 is not properly	Check the air pressure (Refer to Chapter 4Ha, 1-1)
	Solenoid Valve operation error	Replace the valve
	In the case of short fibers, the yarn holding lever setting is inadequate or the fiber holding lever width is too narrow, resulting in a gap	Re-adjust the yarn holding lever (Refer to Chapter 4Ha, 1-3)
	Poor untwisting	Re-adjust the untwisting lever (Refer to Chapter 4Ha, 1-2)
	Splice length is too short.	Set the splice length closer to "Position 1" (Refer to Chapter 4Ha, 1-5)
Splice is easily pulled out	P2 pressure is too low.	Raise the air pressure
	Splice length is too long	Set the splice length closer to "Position 8" (Refer to Chapter 4Ha, 1-5)
	Poor untwisting	Re-adjust the untwisting lever (Refer to Chapter 4Ha, 1-2)
Splice is either cut and too weak or thin and too weak.	P2 pressure is too high	Lower the air pressure
	Splice length is too short	Set the splice length closer to "Position 1" (Refer to Chapter 4Ha, 1-5)
	Too much untwisting	Re-adjust the untwisting lever (Refer to Chapter 4Ha, 1-2)
Long tail on splice 	Splice length is too long	Set the splice length closer to "Position 8" (Refer to Chapter 4Ha, 1-5)
Yarn is not accepted by splicer nozzle	Yarn is caught by the suction mouth	Check for scratches and yarn waste
Thick splice at one side only, or tailing	Splicer cutter is dull	- Remove cotton fly from the cutter - Replace the cutter
	Insufficient clamping of upper and lower yarns	- Check the clamp operation - Either repair the scratch or damage on the yarn guide lever, or replace it - Wipe and clean any impurities stuck to the yarn guide lever
	Inadequate setting of untwisting pipe on one side	Re-adjust the untwisting lever (Refer to Chapter 4Ha, 1-2)
Double ending of lower yarn 	Length of yarn drawn into re-tie pipe is too short	- Remove any yarn waste - Check the lowering position - Check for scratches or damage on the spinning bobbins - Check the blower static pressure - Check the kink preventer (Refer to Chapter 4Ma)
	Re-tie pipe double picking	- Check the spinning bobbins - Check the re-tie pipe operation

4-2 Notes Relating to Strength Measurement

- **Measure both the “parent yarn” and the “spliced yarn” on the winding unit 10 times each, alternating back and forth, and calculate the minimum strength and the average retention rate.**
- **The spliced yarn shares the same features with its “parent yarn.” So do not measure the “parent yarn” and the “spliced yarn” on different spinning bobbins.**

4-3 Retention Rates

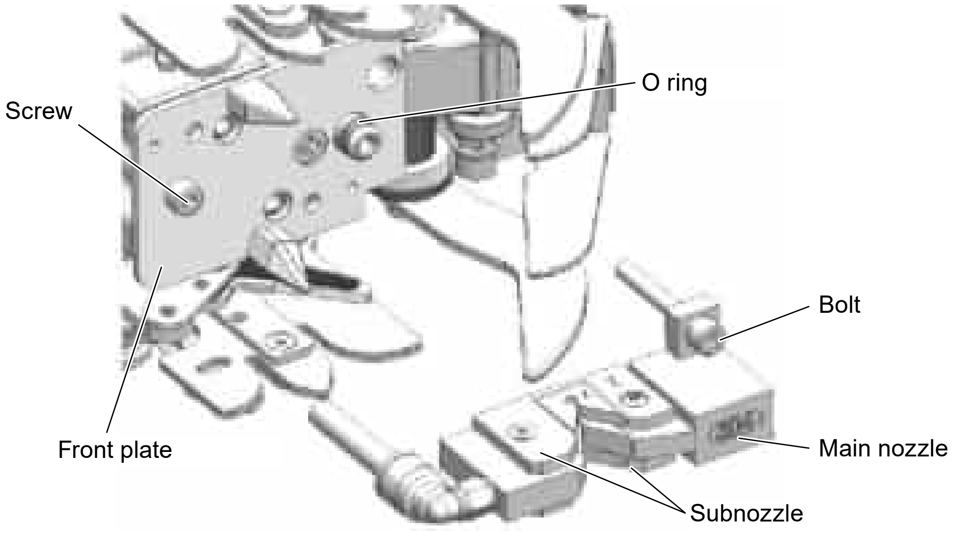
Knots made by a knotter tend to cause resistance because they can get caught when the yarn is drawn through in subsequent winding processes. As a result, the knots need to be stronger.

For splicers, however, the strength of the splice can be slightly lower than the strength of the parent yarn, because there are no knots in the splices and they can stretch. As a general guideline, refer to the rates below for the minimum strength required for splices.

Yarn for yarn counts thinner than Ne20'S	50% or more of the average strength of the parent yarn
Yarn for yarn counts thicker than Ne20'S	30% or more of the average strength of the parent yarn

Sec 5 Three-tier Nozzle [Option]

5-1 Names of Each Part & Mounting Method



The splicer nozzle assembly consists of a main nozzle and two supplementary twisting nozzles, forming three-tier.

CAUTION The main nozzle and the subnozzle have been assembled together with fine adjustment. Do not disassemble them as doing so could lower performance or cause damage.

* Refer to Chapter 4Ha, 2-2 for details on precaution when mounting splicer nozzle.

5-2 VOS Settings

The VOS settings listed below are added to the lists in Chapter 4Ha, 1-5. Change the compressed air discharge time when necessary.

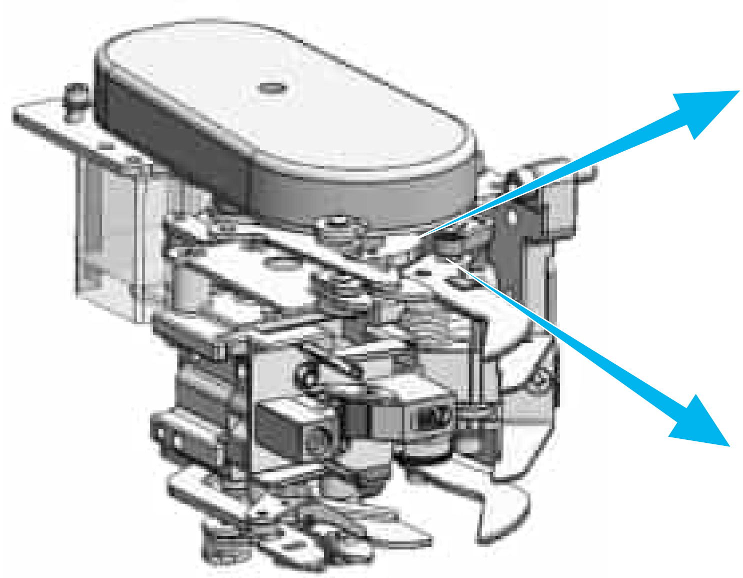
Twisting Time [C]	Set the compressed air discharge time for the main nozzle
Three-tier Nzzl Spl Tm [E]	Set the compressed air discharge time for the subnozzle

Sec 6 Stretch Air Splicer (SAS) [optional]

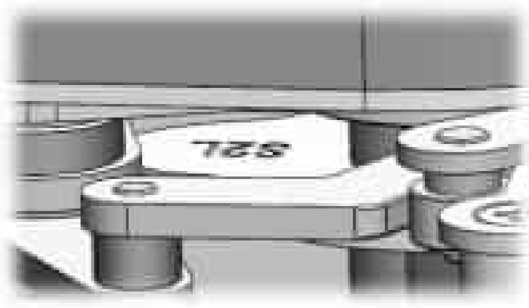
6-1 Features

The stretch air splicer is an air splicer that has been specialized to maintain elasticity in splice joints when splicing Spandex yarn. It uses a clamp cutter, however this can be switched for a standard cutter and the VOS settings changed in order to allow for handling of standard, non-elastic yarn as well.

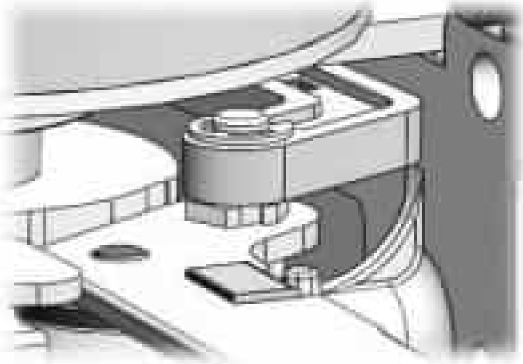
6-2 Change locations



- **S2L cam**
  Yarn guide lever operation changes depending on rotation direction.



- **Yarn guide lever with eccentric pin**
  Allows for adjustment of the yarn guide lever stop position.



6-3 VOS Settings

The following VOS setting items will be required in addition to the items noted in Chapter 4Ha, 1-5.

Splicer model	MODEL-2
Re-tie pipe top opener cam	Without

* Refer to Chapter 4Ga for re-tie pipe setting details.

Chapter

4la PC Sensor

Introduction

- **Warning**

The PC sensor is a precision instrument. Failure to follow the guidelines below could result in malfunction or failure.

- Do not disassemble.
- Do not touch the detection shaft.
- Handle with care because the PC sensor is extremely fragile and very vulnerable to strong impact.

- **Yarn incompatible with PC sensor**

If the following yarn is used for winding, it may cause damage or faulty detection.
We recommend following the procedure described later to remove the sensor and to perform the winding operation in the tension manager section.

- Dirty yarn contaminated with such contaminants as grease that could significantly smear the detection shaft.
- Yarn that could wear down the ceramic guide and the detection shaft that make up the yarn path.

Sec 1 Adjustment Standard

1-1 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

PC Sensor	Select "Without" or "With"
Tension Control System	Select from: Tension Mgr / Tension Fdbk / Fix Appld Tnsn

* If the PC sensor is turned OFF, the tension feedback cannot be selected.

Sec 2 Maintenance

2-1 Cleaning

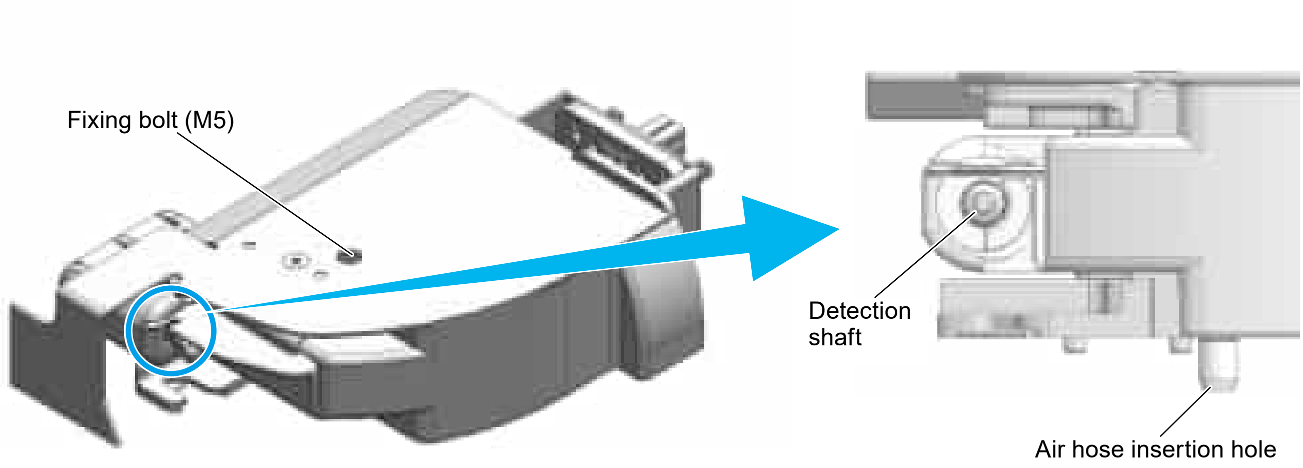
If any cotton fly or waste is stuck to the detection shaft or yarn guide, remove it gently using a cloth or cotton swab moistened with water, or water diluted with mild detergent.

CAUTION

- Do not apply too much pressure on the detection shaft when cleaning.
- Cleaning methods which place any load on the detection shaft, such as wiping with a cloth or blowing with an air blast from close range, can damage the PC sensor.
- Do not use alcohol based agents (thinner, benzine, etc.).

2-2 Damage & Failure

If part of the PC sensor is damaged or has failed, replace the entire PC sensor unit.



Removing & Attaching the PC Sensor

1. **Remove the PC tensor from the winding unit while the PC sensor is attached.**
2. **After removing the (M5) bolt shown above and the air hose, remove the PC sensor from the PC tensor.**

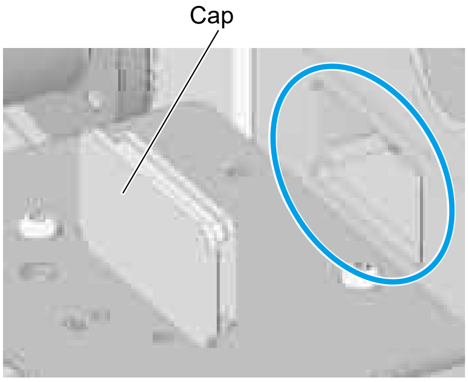
* To attach the PC sensor, perform the removal procedure in reverse order.

CAUTION

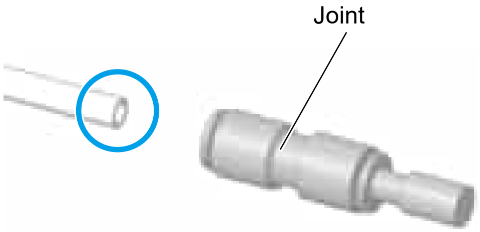
Attaching and removing the PC sensor while PC tensor is attached to the winding unit may cause the air hose insertion hole to break.

When Using the Winding Unit without the PC Sensor Attached

Cover the 2 places indicated below with the special parts provided.



Sensor connection for the casing



Air pipe connected to the PC sensor

Chapter 4Ja PC Tensor (Gate)

Sec 1 Adjustment Standard

1-1 VOS Settings

The VOS settings are listed below.

Tensor	Select “Gate”

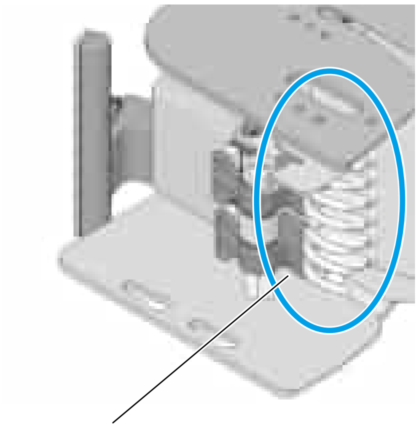
1/2
Sec

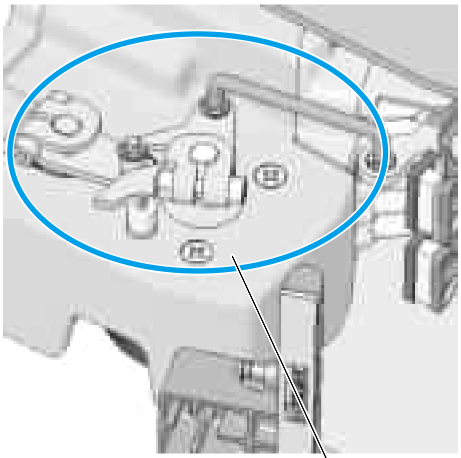
Sec 2 Maintenance

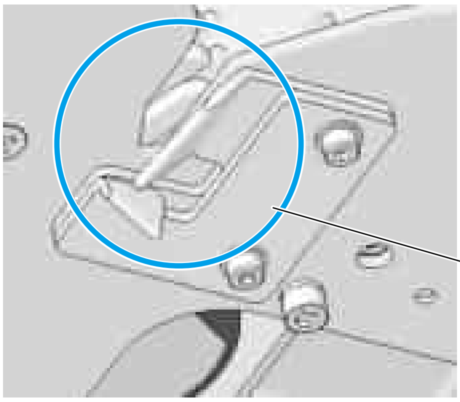
2-1 Gate & Lever Cleaning

If there is any yarn waste or cotton fly buildup around the gate, lever or guide, the appropriate tension may not be possible or the opening and closing operations may not work.

Frequency	Item	Guideline
Weekly	Gate surroundings	Remove of cotton fly and yarn waste buildup around gate section
	Lever surroundings	Remove of cotton fly and yarn waste buildup around lever section
	Guide surroundings	Remove of cotton fly and yarn waste buildup around guide section



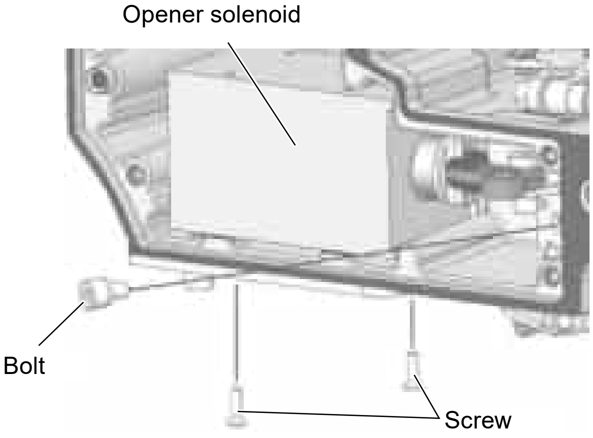




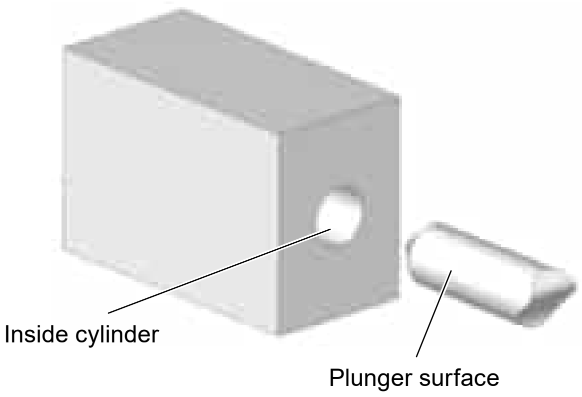
2-2 Opener Solenoid Cleaning

Clean the opener solenoid if EF alarm is displayed on the unit's indicator and the gate does not open up sufficiently, except in cases when there is yarn or cotton fly entanglement, or parts corrosion.

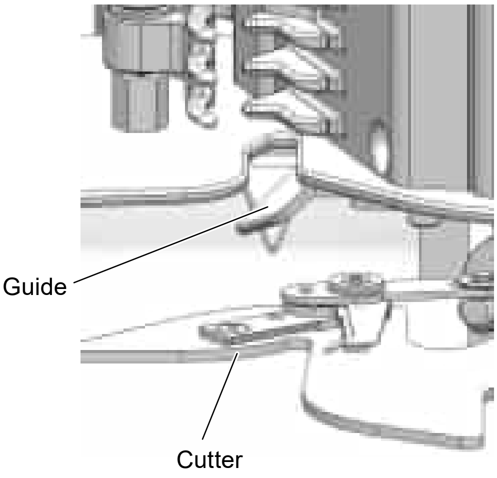
1. **First remove one bolt and then the two screws.**


Opener solenoid
Bolt
Screw

2. **Remove the opener solenoid, and clean the inside of the cylinder and the plunger surface.**

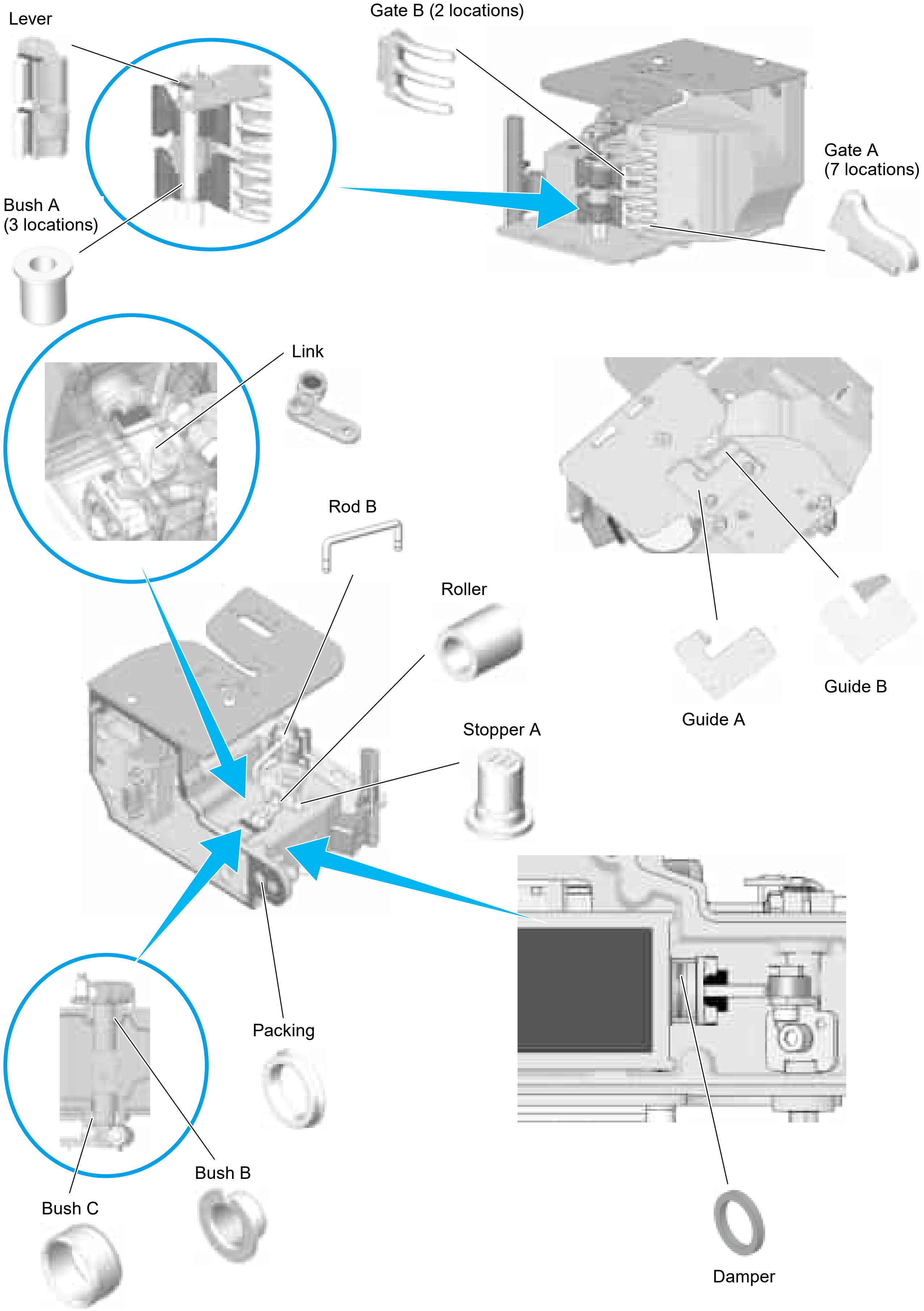

Inside cylinder
Plunger surface

CAUTION Be careful to ensure the guide does not contact the cutter when cleaning or attaching and removing the ASSY.


Guide
Cutter

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.


Lever
Gate B (2 locations)
Gate A
(7 locations)
Bush A
(3 locations)
Link
Rod B
Roller
Guide B
Guide A
Stopper A
Packing
Bush B
Bush C
Damper

Chapter

4Lb PC Bal-Con (Tray)

Introduction

Make adjustments from the left following the order of the arrows. The adjustment procedures are noted in the adjustment standards for each chapter.

Item to be adjusted When adjustment is necessary	1-1 Bal-Con height →	1-2 Bobbin holder position →	1-3 Bobbin angle and right/left position →	1-4 Movable Bal-Con stop position →	1-5 Bobbin forward/ rear position →	1-6 Ejector home position correction
When replacing a winding unit	○	○	○	○	○	○
When performing a lot change (When the Bal-Con and ejector are not removed)	○	○	---	○	○	---
When removing the only Bal-Con	○	---				
When removing the only ejector	---	○	○	---		○
*Reference chapter in instruction manual	Chapter 4Lb	Chapter 4Pb	Chapter 4Pb	Chapter 4Lb	Chapter 4Lb	Chapter 4Pb

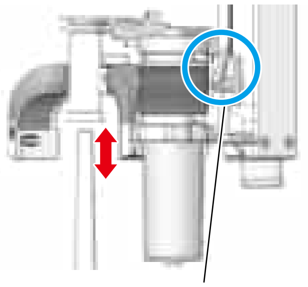
CAUTION

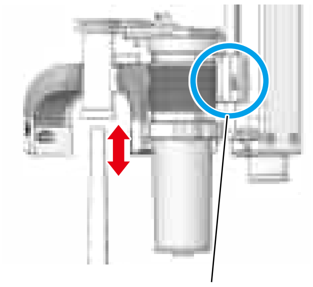
> If the Bal-Con sensor position is changed, the forward or rear position of the bobbin will change relative to the movable Bal-Con.
> Set the movable Bal-Con stop position on the VOS.

Sec 1 Adjustment Standard

1-1 Bal-Con Height

Adjust the height of the Bal-Con using the clamp lever or the bolt on the right hand side.

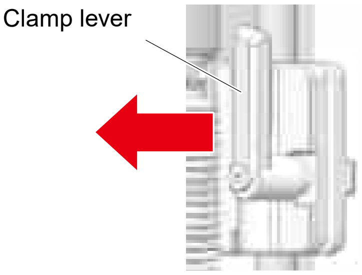




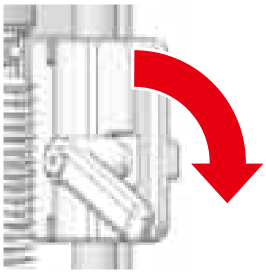
How to Use the Clamp Lever

Pulling the lever towards you only unlocks the lever.

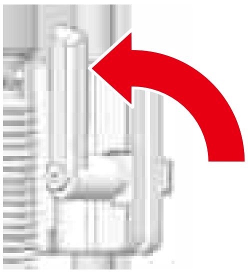
- **When the clamp lever is loose**



1. Pull the lever towards you.



2. Once the lever is pulled towards you, turn it to the right.



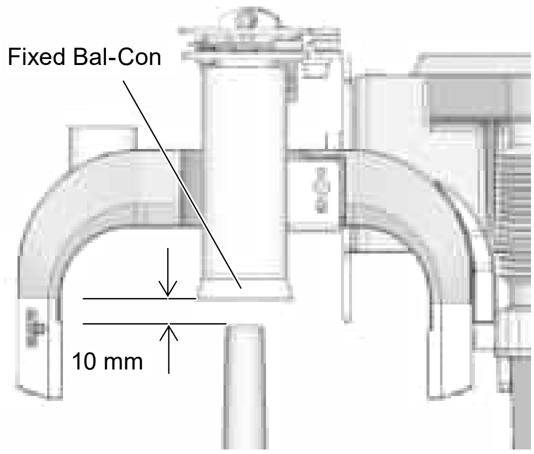
3. Push the lever towards the back, and turn it to the left to loosen.

* To tighten the clamp lever, follow the loosening procedure but in reverse order.

* After adjusting the Bal-Con height, set the clamp lever in an upward direction so that it does not interfere with the adjacent winding unit.

Bal-Con Height Adjustment Position

Adjust the distance between the forward end of the bobbin head and the bottom end of the fixed Bal-Con to 10 mm.



1-2 Bobbin Holder Position

Refer to Chapter 4Pb, 1-2.

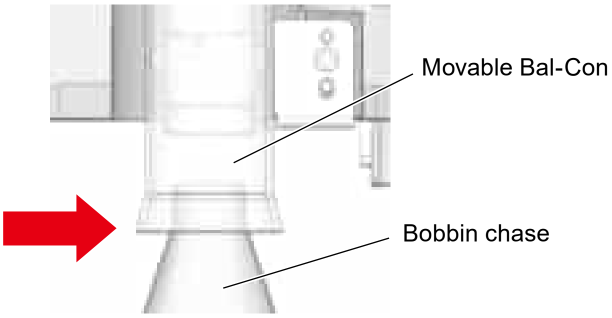
1-3 Bobbin Angle & Right/Left Position

Refer to Chapter 4Pb, 1-3.

1-4 Movable Bal-Con Stop Position

The stop position for the movable Bal-Con can be adjusted using the “Movable Bal-Con Stop Position” settings on the VOS. (Refer to Chapter 3)

1. **Set to “Bal-Con Operation Check” on the VOS maintenance screen. (Refer to Chapter 3)**
2. **Use the unit operation buttons to ensure that the movable Bal-Con stop position meets the top of the bobbin chase.**
3. **If the stop position does not meet the top of the bobbin chase, select “Up” or “Low” in the “Movable Bal-Con Stop Position” settings on the VOS. Then, adjust it accordingly so that the bottom of the movable Bal-Con meets the top of the bobbin chase.**



Movable Bal-Con stop position

CAUTION

The stop position for the movable Bal-Con may vary depending on the winding unit.

1-5 Bobbin Forward/Rear Position

After adjusting the movable Bal-Con stop position, adjust the forward or rear position of the bobbin.

CAUTION

When adjusting the forward or rear position of the bobbin, ensure that the following position adjustments have been completed: Bal-Con height, bobbin holder position, bobbin angle and right / left position, and movable Bal-Con stop position. When checking, use empty bobbins.

1. **Set to “Bal-Con Operation Check” on the VOS maintenance screen. (Refer to Chapter 3)**
2. **After performing the centering operation using the unit operation buttons, set the Bal-Con to the bottom position.**

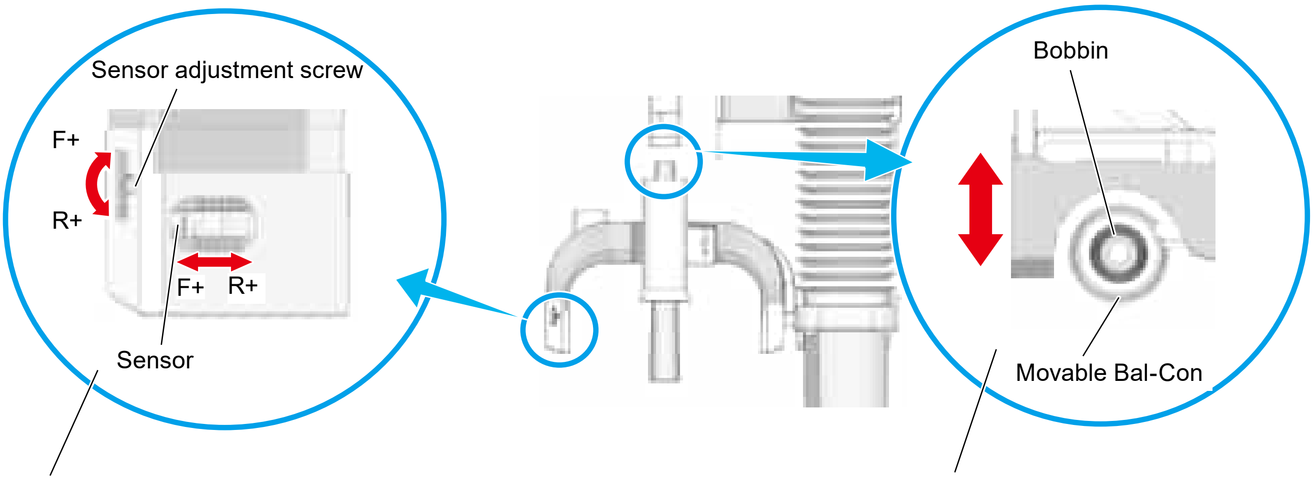
   * If the Bal-Con does not lower to the bottom position, re-adjust the bobbin angle on the ejector. (Refer to Chapter 4Pb)
3. **Ensure that the bobbin and the movable Bal-Con center are aligned.**

Bobbin forward misalignment	Adjust the sensor towards the rear (R+)
Bobbin rear misalignment	Adjust the sensor towards you or forward (F+)

4. **After adjusting the sensor, check again to ensure that the bobbin and the movable Bal-Con center are aligned.**

   * Repeat until the bobbin and the movable Bal-Con center are aligned.

   * When setting the Bal-Con to the bottom position, ensure that the sensor is turned OFF.



If the sensor position is changed, the forward or rear position of the bobbin will change relative to the movable Bal-Con.

Adjust the bobbin forward or backwards so that it is in the center of the movable Bal-Con.

1-6 Ejector Home Position Correction

Refer to Chapter 4Pb, 1-6.

1-7 VOS Settings

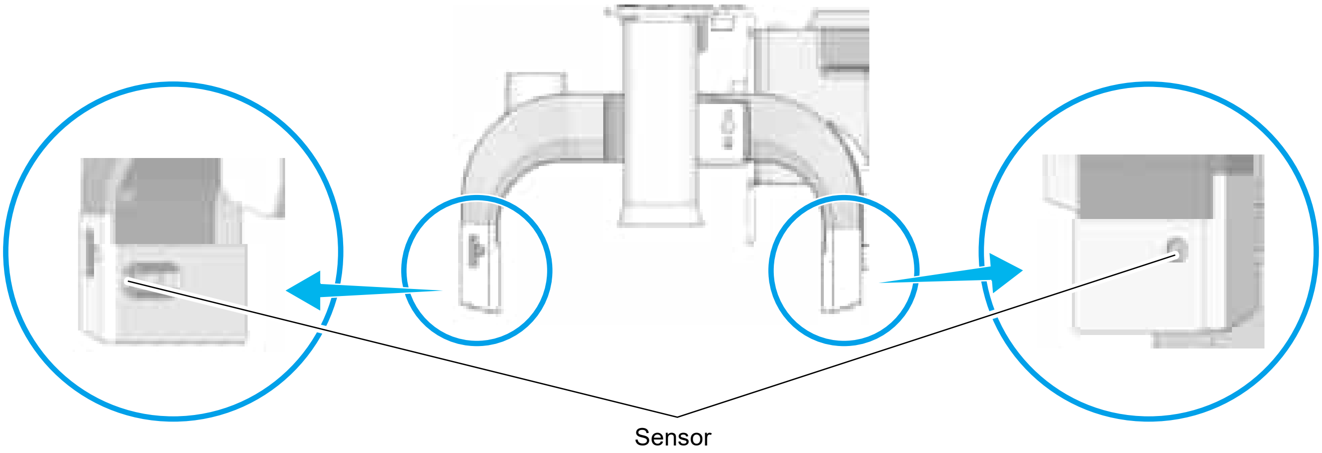
The VOS settings are listed below. Change the setting conditions when necessary.

PC Bal-Con Action	Selet “ON”
Movable Bal-Con Stop Pos.	Select from: STD±0 / UP 1 to 5 / DOWN1 to 2
Bobbin Length	Set the bobbin length
Bal-Con Operation Check	Select “OFF” or “ON”

Sec 2 Maintenance

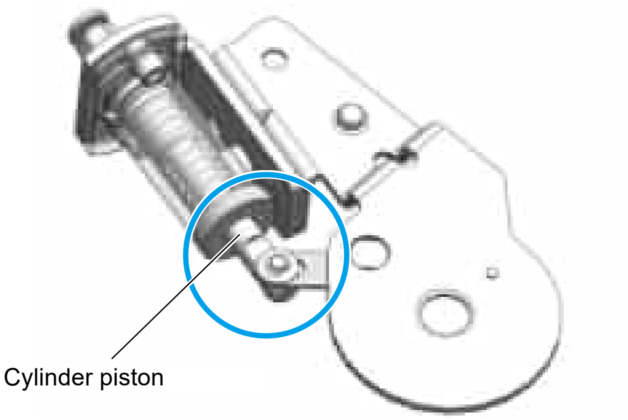
2-1 Sensor Cleaning

If cotton fly or waste is stuck to the sensor, the Bal-Con may not operate correctly.
Remove all cotton fly around the sensor using an air gun once a month.



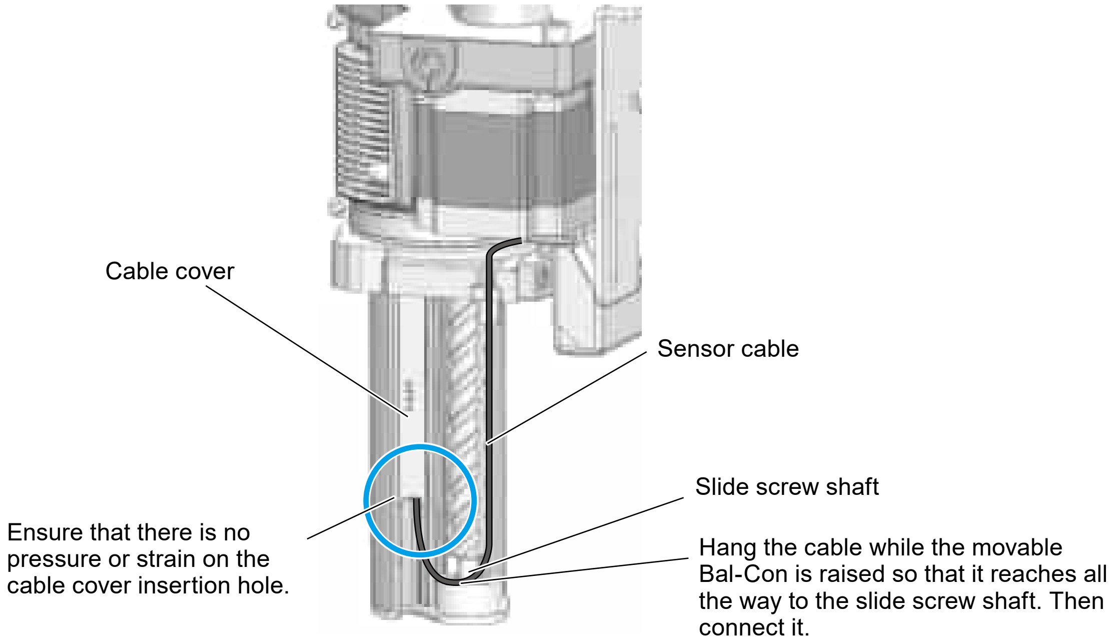
2-2 Eject Cutter Cleaning

Remove any cotton fly around the forward end of the cylinder piston once a month.



2-3 Precautions When Connecting the Sensor Cable

When connecting the sensor cable, hang the cable while the movable Bal-Con is raised so that it reaches all the way to the slide screw shaft. Then connect it.

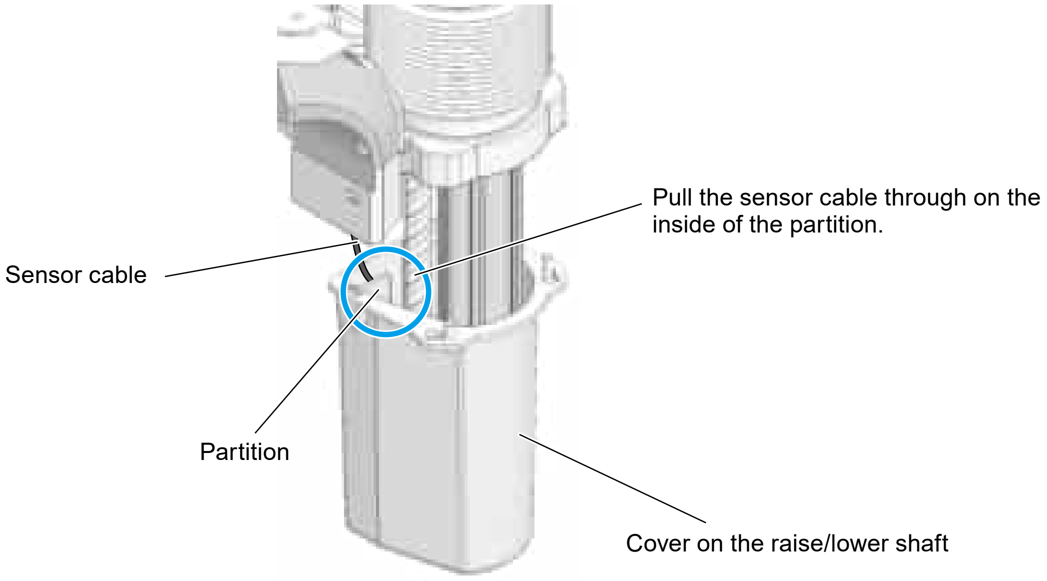

Cable cover
Sensor cable
Slide screw shaft
Ensure that there is no pressure or strain on the cable cover insertion hole.
Hang the cable while the movable Bal-Con is raised so that it reaches all the way to the slide screw shaft. Then connect it.

CAUTION

If there is insufficient slack in the cable length, the cable may disconnect.

2-4 Precautions When Installing the Lower Cover on the Raise/Lower Shaft

When installing the lower cover on the shaft (raise/ lower) section, pull the sensor cable through on the inside of the partition.


Pull the sensor cable through on the inside of the partition.
Sensor cable
Partition
Cover on the raise/lower shaft

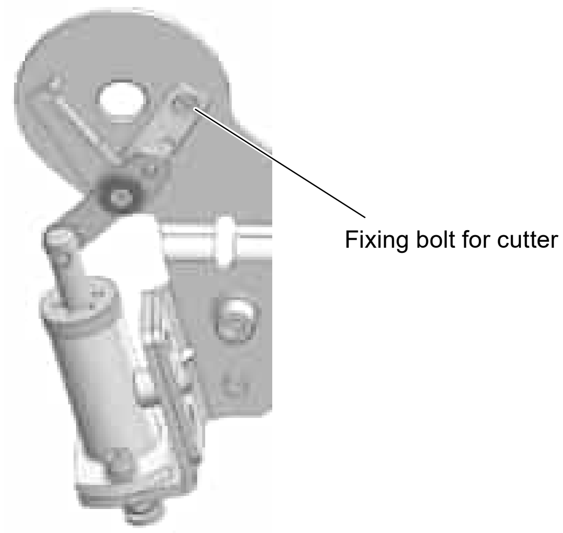
CAUTION

If the cable is not pulled through on the inside of the partition, the cable may disconnect.

2-5 Precautions When Mounting the Eject Cutter

CAUTION

- Apply locking adhesive to the bolt before mounting the cutter.
  Since the cutter is ceramic, over-tightening the fixing bolt may cause the cutter to fracture or break. (The recommended tightening torque is between 0.2 and 0.3 N•m)
- Be sure not to touch the cutter as it can cause injury.



2-6 Inspection & Lubrication

Frequency	Item	Guideline
Every 6 months	Guide shaft, Slide screw, Arm guide, Arm guide felt	Check the oil level for each part and lubricate when necessary *MOLYKOTE EM-50L
Yearly	Guide shaft	Apply grease to the section that supports the guide shaft *Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)
	Eject cutter, Cylinder	• Disassemble the cylinder and lubricate the inside of it • Use a maintenance tool and lubricate the packing parts *Extreme-pressure lithium-based grease with mineral oil, NLGI No.2

Bal-Con

1. **Pull the unit operation switch.**
   Unit operation will stop.
2. **Loosen the bolt that holds the fixing band onto the lower part of the bellows. Then, manually lower the Bal-Con.**
3. **Remove all old grease on each part completely.**
   * Disassemble and clean when necessary

CAUTION

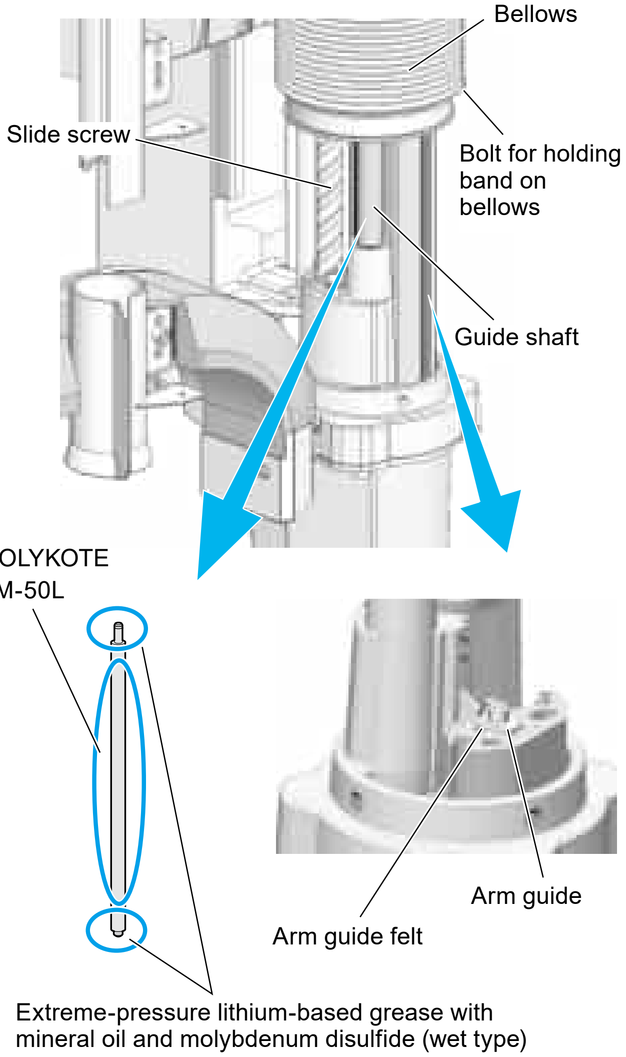
When old grease congeals, it increases the resistance on the sliding screw and nut, causing the mechanism to wear at a faster rate. Therefore, clean and remove old grease.

4. **Apply grease (0.5 mL) to the guide shaft, slide screw, arm guide and arm guide felt.**

CAUTION

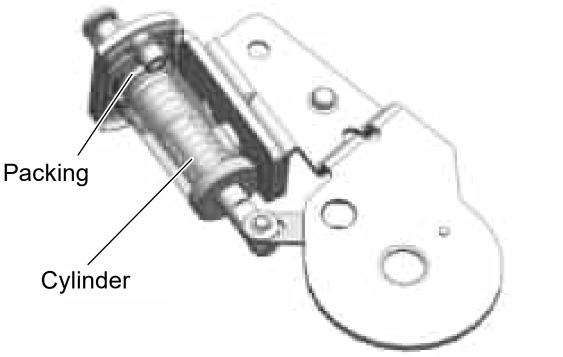
If too much grease is applied, it produces resistance and causes malfunction. Therefore, apply the proper amount evenly.

5. **Spread the grease evenly by raising and lowering the Bal-Con manually 2 to 3 times.**
6. **Apply grease to the section that supports the guide shaft.**


Bellows
Slide screw
Bolt for holding band on bellows
Guide shaft
MOLYKOTE EM-50L
Arm guide
Arm guide felt
Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)

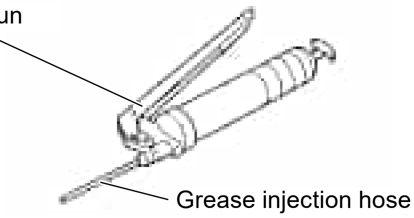
Eject Cutter

Lubricate using a cylinder maintenance tool. For the details, refer to Chapter 4Lb, 2-7.

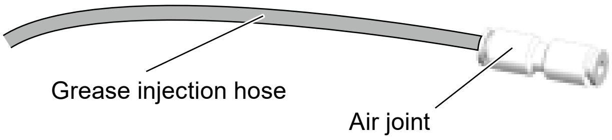

Packing
Cylinder

2-7 Grease Injection into Cutter Cylinder

1. **Using the grease gun provided, inject enough grease so that it fills up the front end of the grease injection hose (length 12 cm).**


Grease gun
Grease injection hose

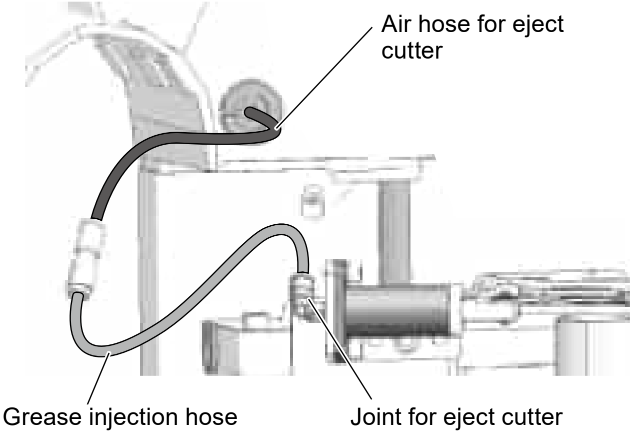
2. **Connect the grease filled hose to the air joint provided.**


Grease injection hose
Air joint

3. **Pull off the eject cutter air hose, attach the air joint from step 2, and insert the opposite end of the grease injection hose onto the joint for the eject cutter.**

   * If you remove the tensor box, it makes this lubrication task easier to perform.

4. **Turn on the air using the output check mode for the eject cutter, and inject the grease. (Refer to Chapter 3 for further details on the check mode.)**

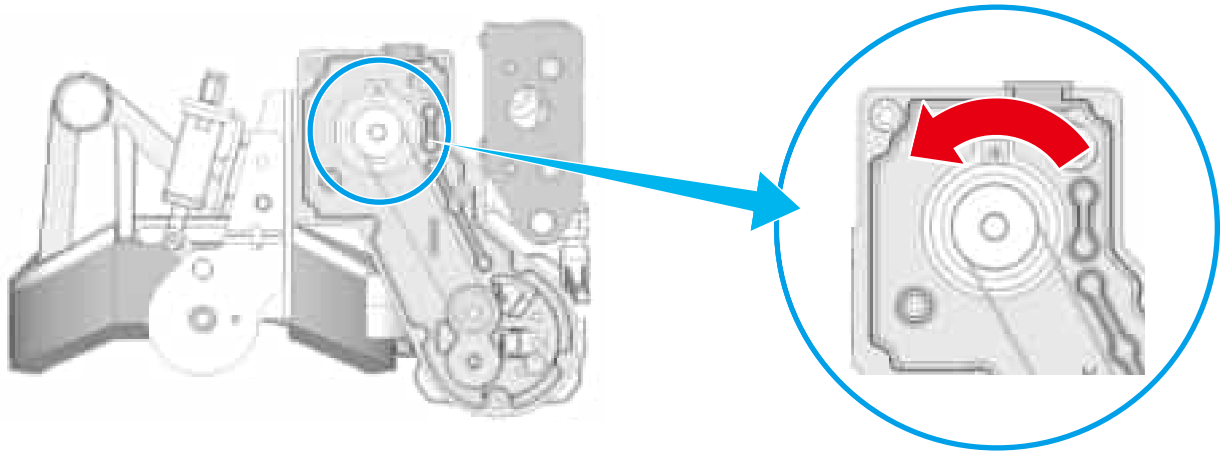

Air hose for eject cutter
Grease injection hose
Joint for eject cutter

2-8 Tightening the Timing Belt

Turn and adjust the motor.

CAUTION

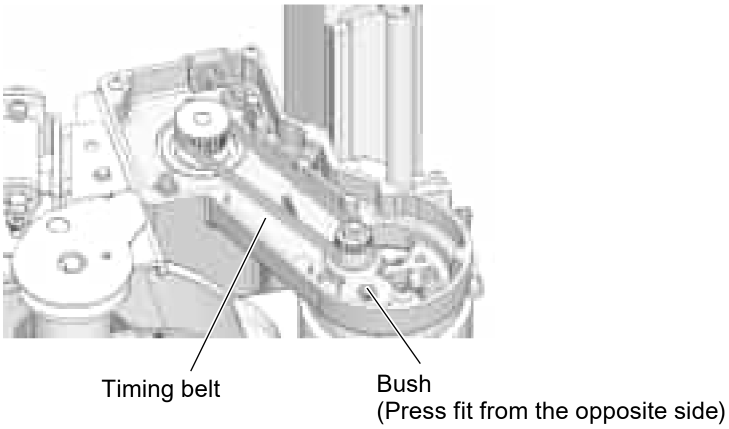
Ensure that the belt is not too slack or too taut. (Recommended tension:30.2 – 40.6 N) Malfunctions could occur if the tension is out of the recommended range.

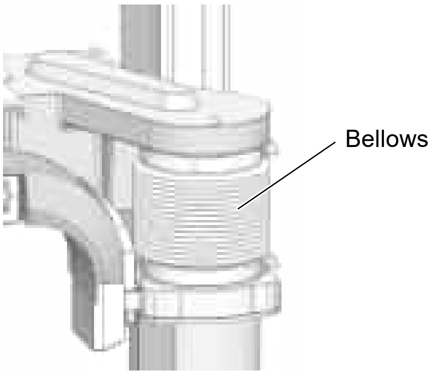


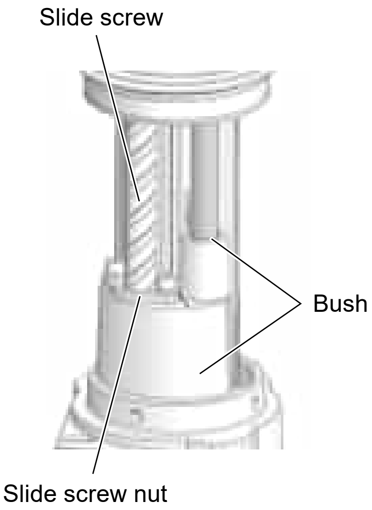
Sec 3 Consumables

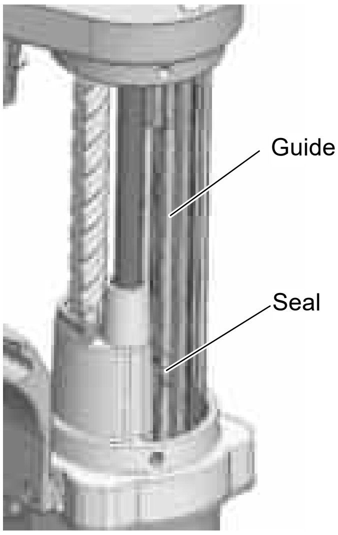
If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.

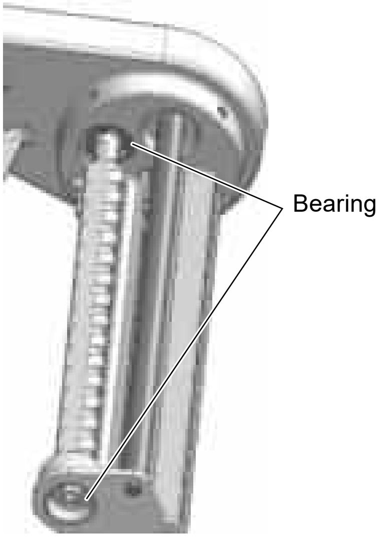
Bal-Con


Timing belt
Bush
(Press fit from the opposite side)

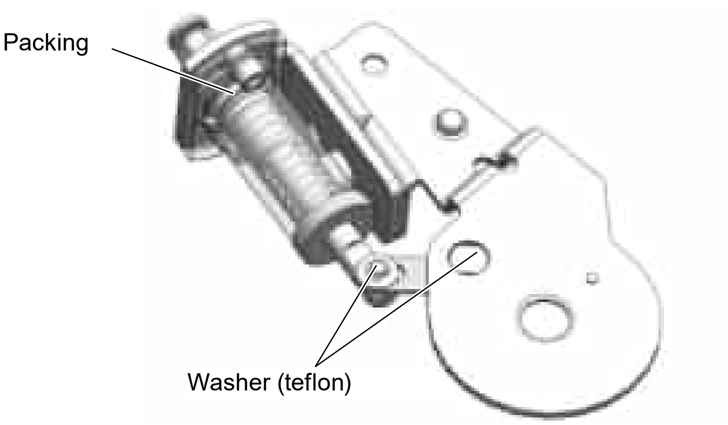



Slide screw
Bush
Slide screw nut





Eject Cutter

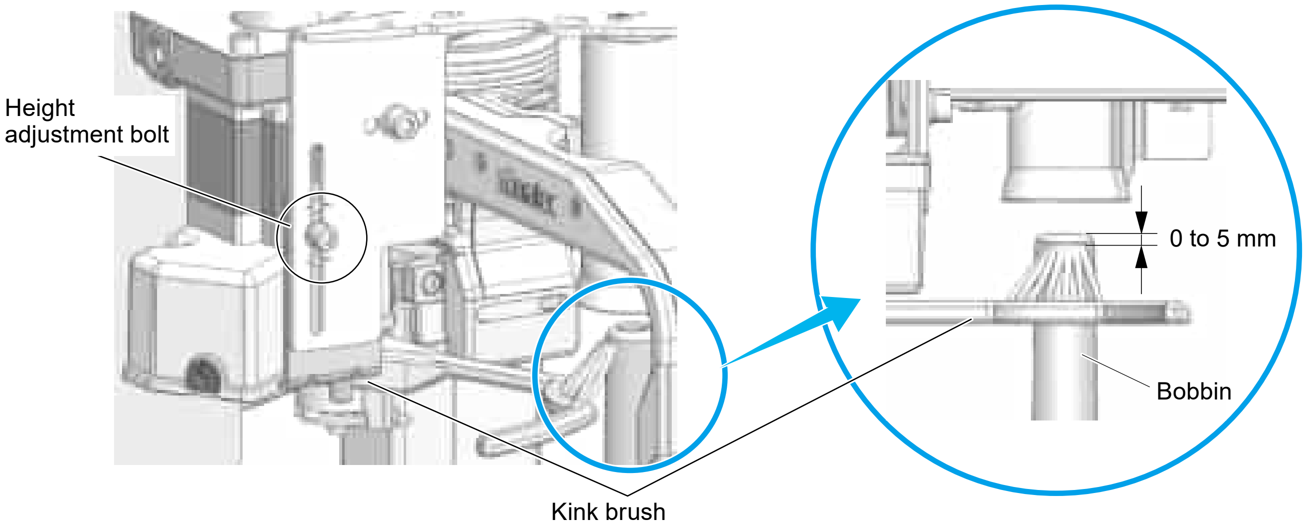

Packing
Washer (teflon)

Chapter 4Ma Kink Preventer

Sec 1 Adjustment Standard

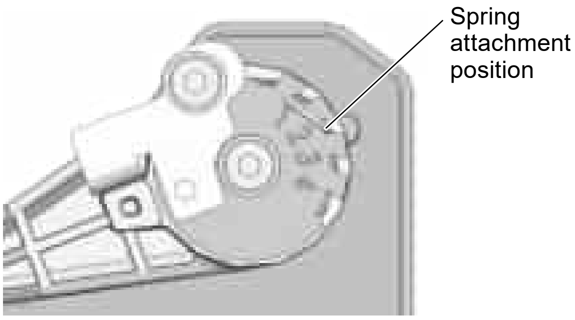
1-1 Kink Preventer Height

Adjust the height of the kink preventer using the installed bracket bolt. Adjust the kink preventer position so that the end of the brush is between 0 to 5 mm from the end of the bobbin.


Height
adjustment bolt
0 to 5 mm
Bobbin
Kink brush

1-2 Brush Holding Force

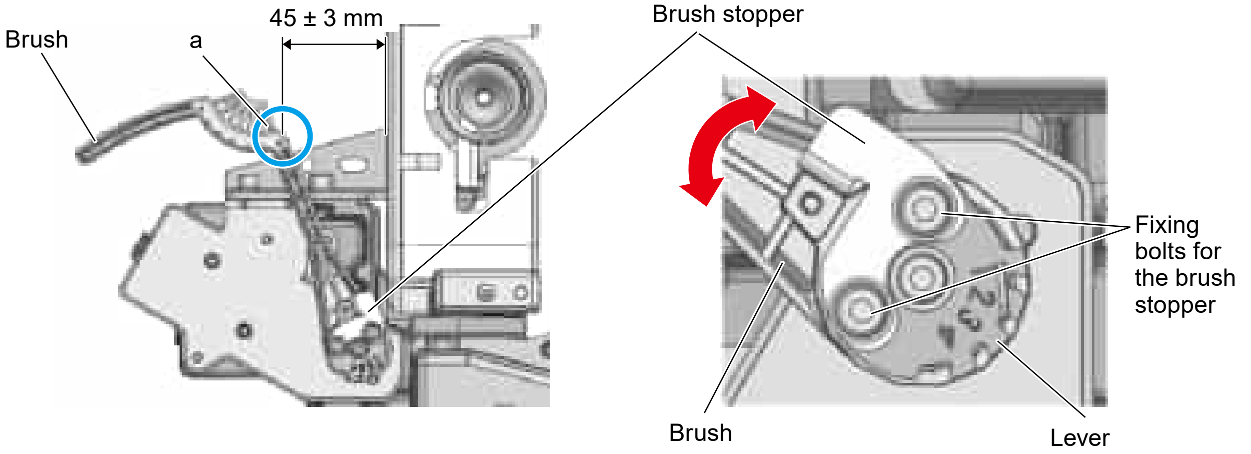
You can adjust the brush holding force of the bobbin by adjusting the position of the kink spring.
Setting it to a larger number increases the strength of the brush's holding force.
The default setting is the No.2 position.


Spring
attachment
position

1-3 Kink Standby Position Adjustment

Adjust the kink standby position at the brush stopper position.

1. **Adjust the brush stopper position so that the distance between the rear side of the Bal-Con and point “a” in the kink diagram is 45 ± 3 mm.**

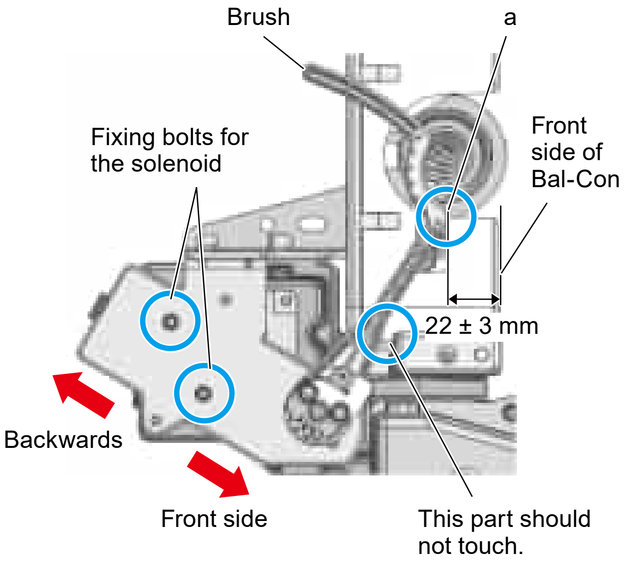

Brush
a
45 ± 3 mm
Brush stopper
Fixing bolts for the brush stopper
Brush
Lever

1-4 Kink Operating Position Adjustment

Adjust the kink operating position at the solenoid position.

1. **Set to “Kink Operating Position Adjustment Mode” on the VOS maintenance screen. (Refer to Chapter 3)**
2. **Use the unit operation buttons to set the position where the kink operates.**
3. **Make adjustments using the fixing bolts for the solenoid so that the distance between the front side of the Bal-Con and point “a” in the kink diagram is 22 ± 3 mm.**

Front side of solenoid	Brush operating position moves backwards
Rear side of solenoid	Brush operating position moves forward


Brush
a
Front side of Bal-Con
Fixing bolts for the solenoid
22 ± 3 mm
Backwards
Front side
This part should not touch.

CAUTION

- Ensure that the kink and the Bal-Con should not touch each other.
- Make sure that the Bal-Con sensor is not ON when there is no bobbin.

1-5 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Kink Action (Doffing)	Select from: ON / ON (bunch-off) / OFF
Kink Action	Select "ON"
Kink On Delay	Set between 0 (OFF) and 2.0 seconds
KinkOnDelay(CopChange)	Set between 0 (OFF) and 2.0 seconds
Kink Off Delay	Set between 0 (OFF) and 2.0 seconds

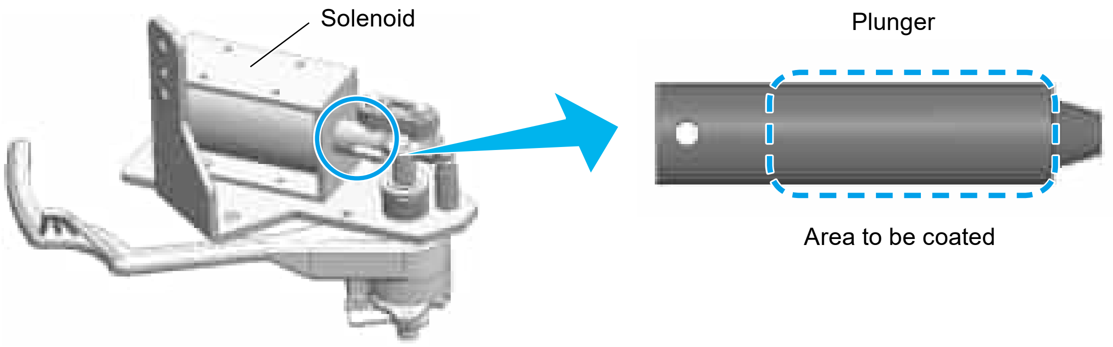
Sec 2 Maintenance

2-1 Cleaning and Lubrication

If the kink brush is operating slowly, remove the solenoid plunger, clean off any dust or other build up from the solenoid interior and plunger, and lightly coat the plunger with grease.

Solenoid

Frequency	Lubricant	Item
As necessary	MOLYKOTE (EM-50L)	Plunger body

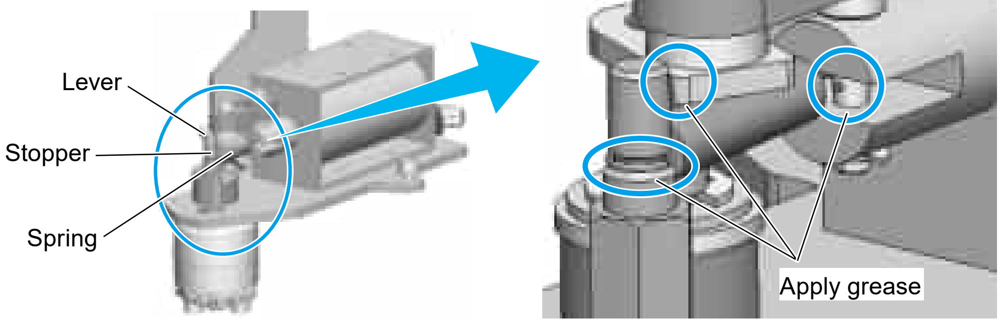


CAUTION

Coat the specified area lightly with grease using approximately 0.05 mL of grease total. If too much grease is used, it may result in malfunctions.

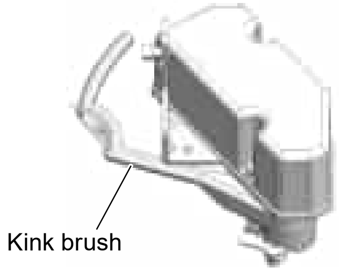
Others

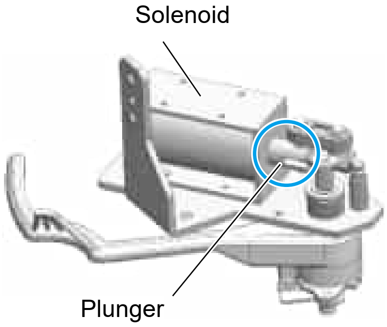
Frequency	Lubricant	Item
Every 6 months	Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide	Contact area between stopper and lever
		Spring hook

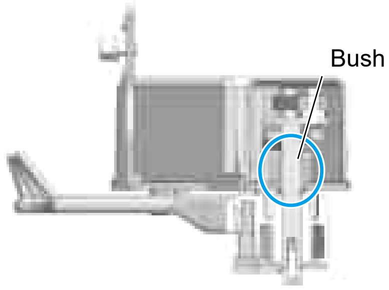


Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.




Solenoid
Plunger



Chapter 4Pb Ejector

Introduction

Make adjustments from the left following the order of the arrows. The adjustment procedures are noted in the adjustment standards for each chapter.

Item to be adjusted / When adjustment is necessary	1-1 Bal-Con height →	1-2 Bobbin holder position →	1-3 Bobbin angle and right/left position →	1-4 Movable Bal-Con stop position →	1-5 Bobbin forward/ rear position →	1-6 Ejector home position correction
When replacing a winding unit	○	○	○	○	○	○
When performing a lot change (When the Bal-Con and ejector are not removed)	○	○	---	○	○	---
When removing the only Bal-Con	○	---				
When removing the only ejector	---	○	○	---		○
*Reference chapter in instruction manual	Chapter 4Lb	Chapter 4Pb	Chapter 4Pb	Chapter 4Lb	Chapter 4Lb	Chapter 4Pb

CAUTION

If the Bal-Con sensor position is changed, the forward or rear position of the bobbin will change relative to the movable Bal-Con.
Set the movable Bal-Con stop position on the VOS.

Sec 1 Adjustment Standard

1-1 Bal-Con Height

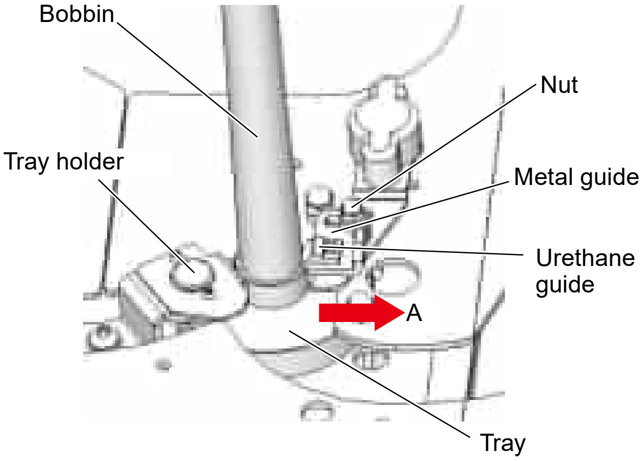
Refer to Chapter 4Lb, 1-1.

1-2 Bobbin Holder Position

Adjust the bobbin holder position so that there is no gap between the bobbin and the tray.

CAUTION

This part does not exist when using a spring tray.



1. **Set a tray with empty bobbins in the position indicated in the figure at the right.**
2. **Loosen the nut and place the bobbin between the tray holder and metal plate guide and fix the metal plate guide's position.**

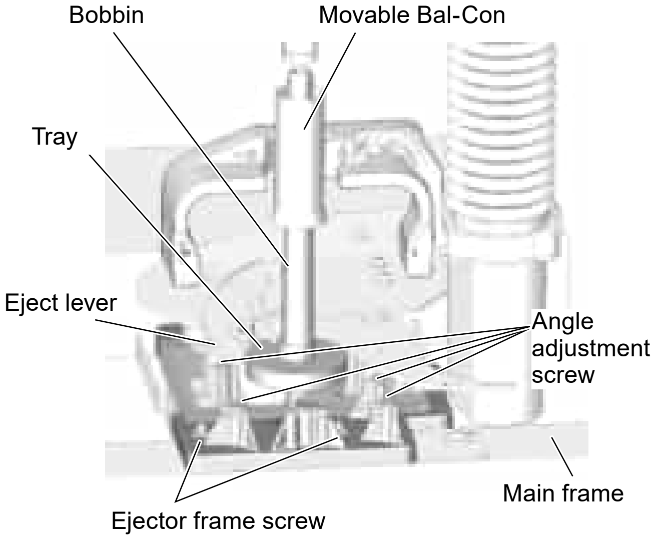
* Adjust while the tray is positioned all the way toward side A from the winding position.

CAUTION

- If the gap between the bobbin and the tray is not appropriately set, the automatic centering function may not work correctly. If the bobbin position changes, check the gap between the bobbin and the tray, and re-adjust when necessary.
- Ensure that the bobbin and the urethane guide always touch each other. If there is a gap, the bobbin may rotate during the winding operation.

1-3 Bobbin Angle & Left/Right Position

When removing the Bal-Con and the ejector, re-adjust the ejector.
Adjust the left or right position of the bobbin using the “Bal-Con Operation Check” in the VOS settings. (Refer to Chapter 3)
Adjust the ejector, and align the left or right position of the bobbin so that it is centered with the movable Bal-Con.



CAUTION

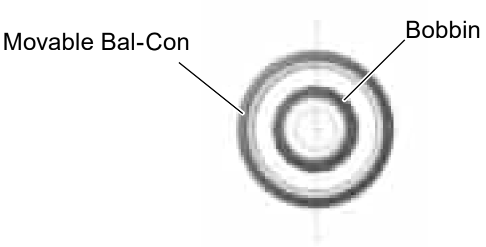
First check if the Bal-Con height has been adjusted before adjusting the ejector position.

1. **Set to “Bal-Con Operation Check” on the VOS maintenance screen. (Refer to Chapter 3)**
2. **Fix the tray with the bobbin in the winding position.**
3. **Set the Bal-Con to the bottom position.**
4. **If the bobbin is leaning in a particular direction, adjust it so that it is standing upright, using the angle adjustment screw.**

CAUTION

If the bobbin is leaning in a particular direction, the movable Bal-Con may not completely descend to the bottom position.

5. **Loosen the ejector frame screw, adjust the ejector, and align the left or right position of the bobbin so that it is centered with the movable Bal-Con.**



Align the left or right position of the bobbin so that it is centered with the movable Bal-Con

For Φ60 tray specification only

6. **When removing the ejector and adjusting the left or right position, adjust the feed conveyor guide on the back of the unit using the specialized jig. (Refer to Chapter 5Fa)**

1-4 Movable Bal-Con Stop Position

Refer to Chapter 4Lb, 1-4.

1-5 Bobbin Forward/Rear Position

Refer to Chapter 4Lb, 1-5.

1-6 Ejector Home Position Correction

Re-adjust the home position when adjusting or removing the ejector.

1. **Set to “Peg/ejection adjustment” on the VOS maintenance screen**.
2. **Correct the home position.**

* When automatic centering is turned OFF, make this adjustment before the “1-2 Bobbin Holder Position” adjustment.

* Using the home correction function stabilizes the cop change operation after the bobbin supply is interrupted. In addition, the position will be the reference position when the automatic centering is turned OFF.

1-7 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Bobbin auto centering fctn	Selet “ON”
Bal-Con Operation Check	Select “OFF” or “ON”

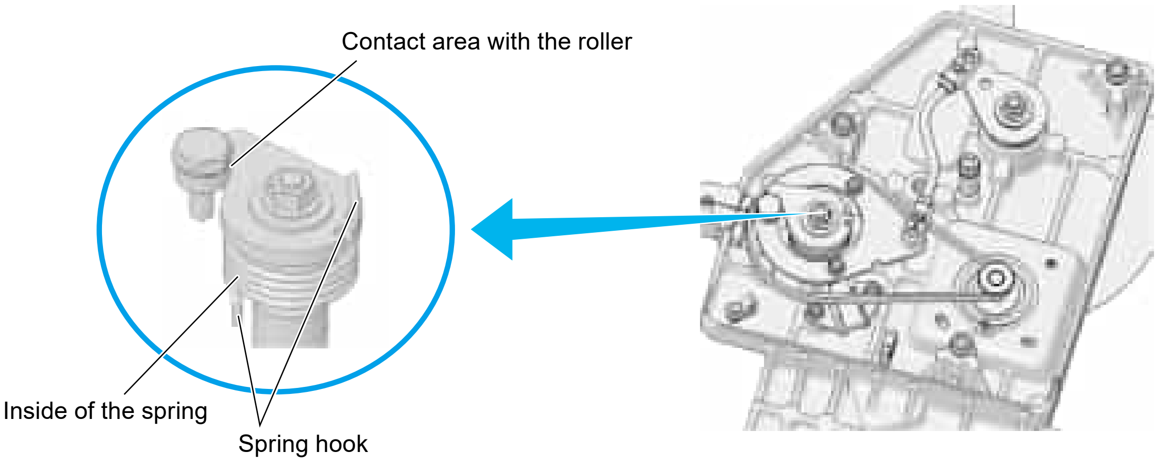
CAUTION

The automatic centering function cannot be used in the following conditions.
- With bobbins that transmit light
- With bobbins that have front end damage
- With bobbins that cannot traverse the Bal-Con sensor

Sec 2 Maintenance

2-1 Inspection & Lubrication

Frequency	Item	Guideline
Yearly	Ejector	• Clean and lubricate the inside and outside of the Ejector • Apply to the contact area with the roller • Apply to the spring hook and the inside of the spring * Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)

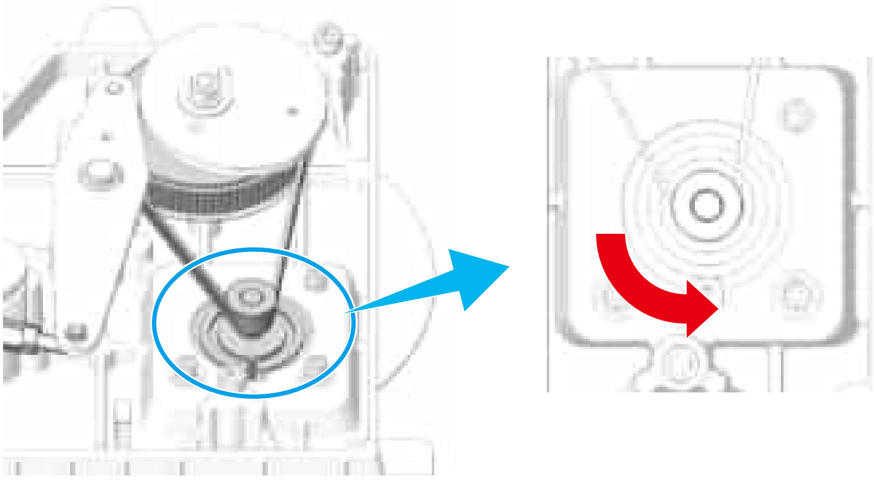


2-2 Tightening the Timing Belt

Turn and adjust the motor.

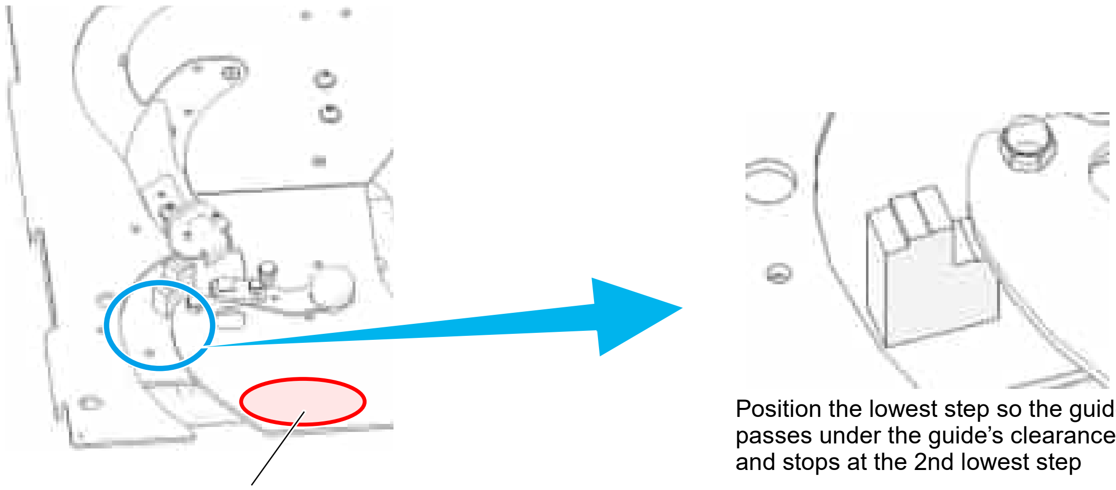
CAUTION

Ensure that the belt is not too slack or too taut. (Recommended tension: 30.2 – 40.6 N)
Malfunctions could occur if the tension is out of the recommended range.



2-3 Checking Height with Tool

Use the tool to check the height in the following location. If there is a problem with the height, correct it.



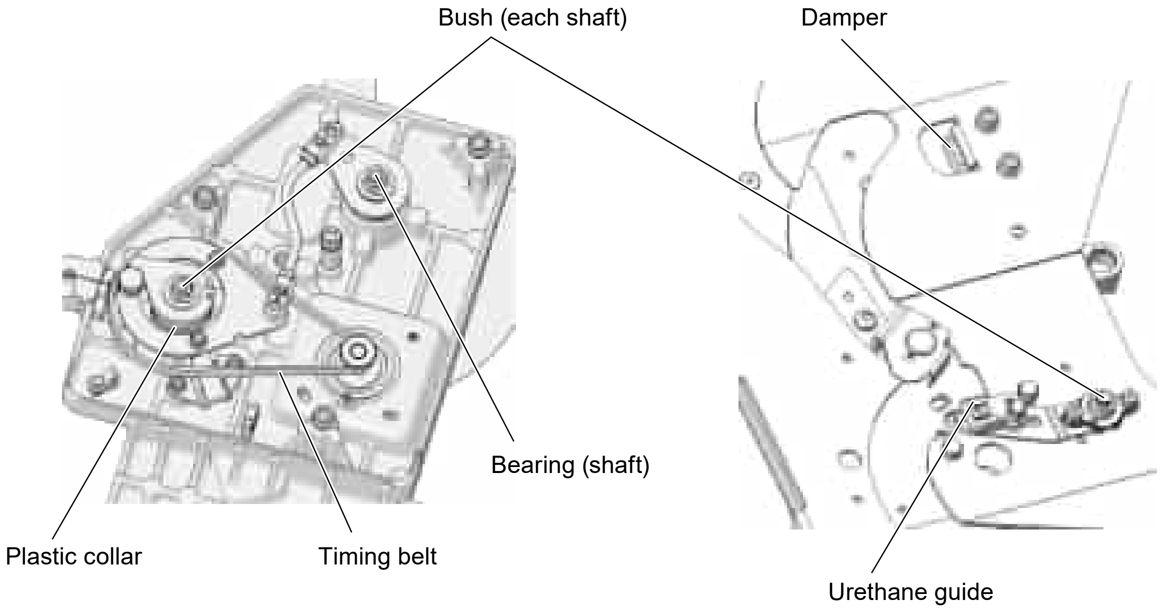
Position the lowest step so the guide passes under the guide's clearance and stops at the 2nd lowest step

CAUTION

When getting on a step ladder to set up the take-up tube, be careful not to step on this part.
If you step on the metal guide, it could deform.

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.

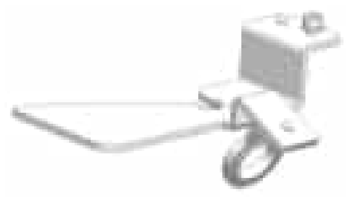

Bush (each shaft)
Damper
Bearing (shaft)
Plastic collar
Timing belt
Urethane guide

Chapter
4Rb Rewind Peg (Tray)

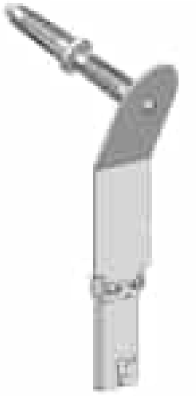
Introduction

* The configurations and usage methods vary on Magazine and tray type machines.

- **Rewind device set**



1 yarn type specification for return conveyor



2 yarn type specification for return conveyor, or bypass conveyor (return) specification

Sec 1 Adjustment Standard

1-1 VOS Settings

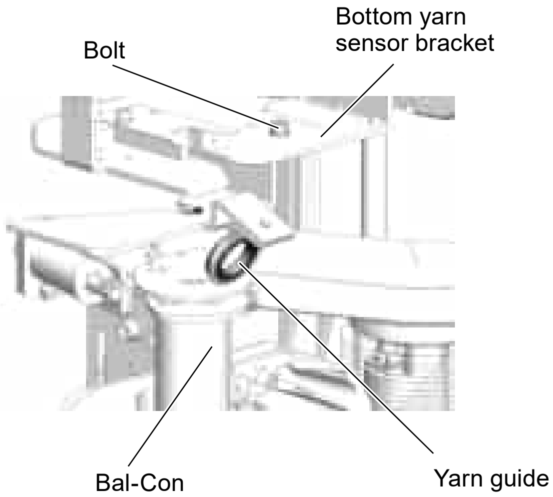
When performing the rewind operation, turn “Rewind mode” ON.

* Refer to Chapter 7 VOS “<11500> Unit Operation Adjustment”.

CAUTION If the rewind operation is performed without turning ON rewind mode, the yarn may get caught on peripheral parts and damage them.

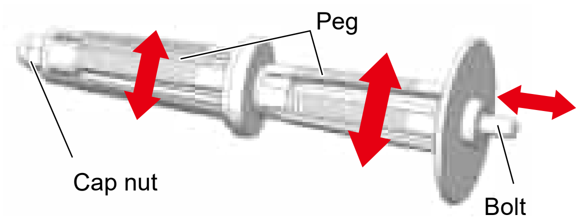
1-2 Yarn Guide Attachment

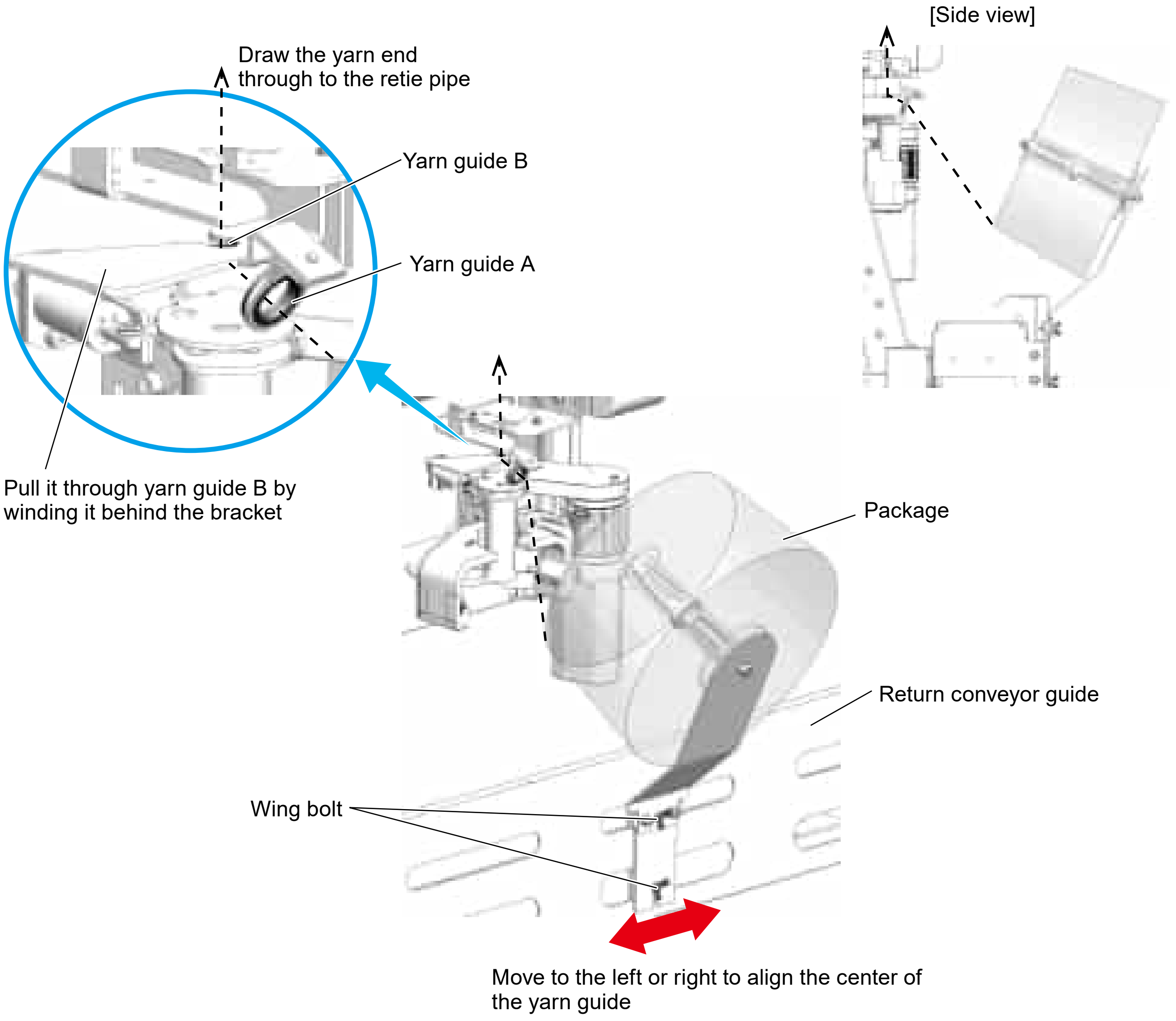
1. **Use the bolt to mount the yarn guide onto the bottom yarn sensor bracket.**
2. **If the Bal-Con is interfering, loosen the clamp lever and adjust the height of the Bal-Con. (Refer to Chapter 4Lb, 1-1)**



1-3 Rewind Peg & Package Preparations

1. **Use the wing bolts to mount the rewind peg onto the unit's return conveyor guide.**
2. **Set the package in place.**
3. **Adjust the peg so it is aligned with the supply tube.**
   Rotate the cap nut to extend the peg.
4. **Mount the peg stand so that the yarn guide and the package are aligned.**
5. **Pull the yarn end through yarn guide A and yarn guide B and then draw it through to the retie pipe.**


Peg
Cap nut
Bolt


[Side view]
Draw the yarn end
through to the retie pipe
Yarn guide B
Yarn guide A
Pull it through yarn guide B by
winding it behind the bracket
Package
Return conveyor guide
Wing bolt
Move to the left or right to align the center of
the yarn guide

6. **Ensure that steps 1 through 5 have been completed before starting the winding operation.**

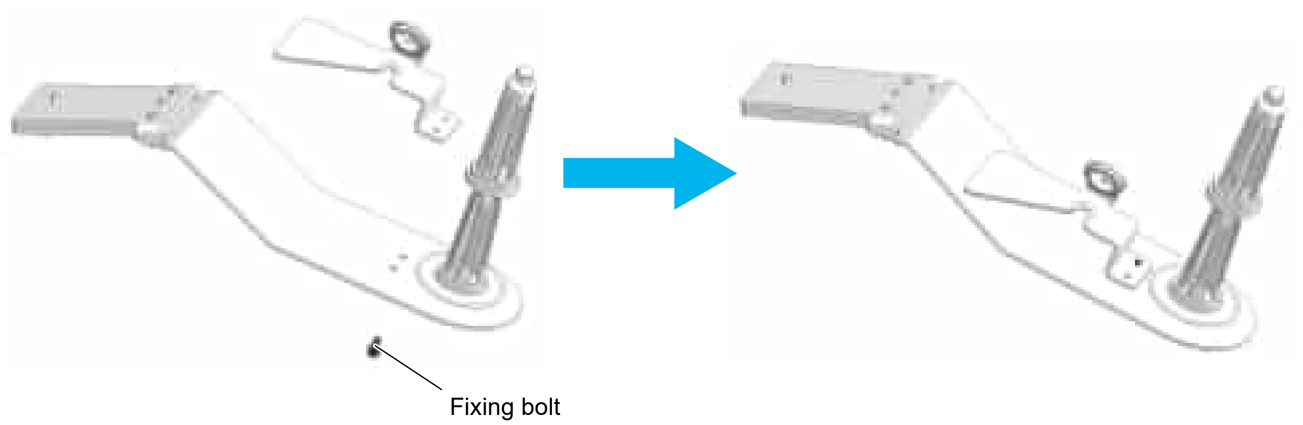
CAUTION

When rewinding, always pull the yarn through the two places on the yarn guide and the Bal-Con. If the yarn passes through another route, the yarn may get caught on peripheral parts and damage the parts.

Sec 2 Maintenance

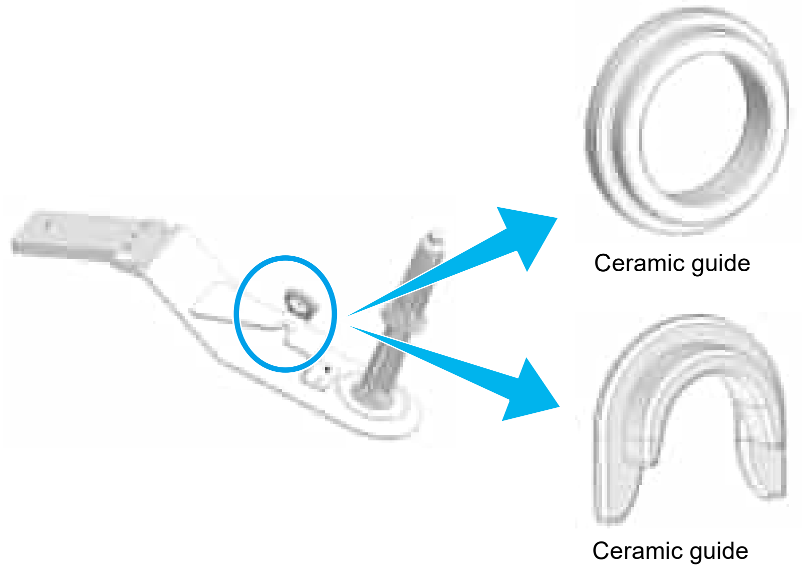
2-1 Storing Parts

All of the parts can be stored as a set when not using the rewind device.


Fixing bolt

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.


Ceramic guide
Ceramic guide

Chapter

4Va Upper Yarn Sensor

Sec 1 Adjustment Standard

1-1 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Upper yarn sensor	Set to “With .”

Sec 2 Maintenance

2-1 Sensor Light Receptor and Projector Cleaning

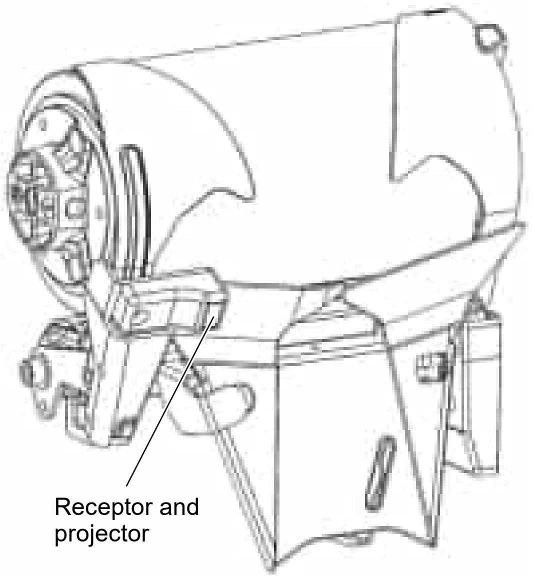
If upper yarn detection miss Er alarms and sensor malfunction Eb alarms occur frequently, use one of the following methods to clean any dirt which has built up on the light receptor and projector.

- **Wipe clean with a dry, soft cloth.**

or

- **Wipe clean using a moist cotton swab or soft cloth.**

* If the dirt or buildup is difficult to remove, use hot water.



CAUTION

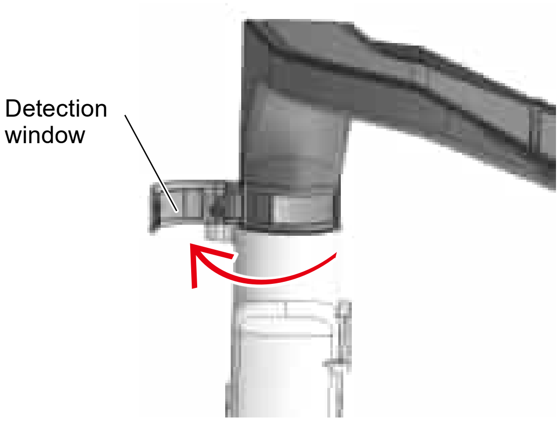
- If the light receptor and projector are scratched, they may not operate properly. Therefore, do not use any hard or sharp objects, etc., when cleaning.
- Do not use any petroleum solvents (such as Zippo oil).

2-2 Suction Mouth Detection Window Cleaning

If upper yarn detection miss Er alarms and sensor malfunction Eb alarms occur frequently, use the following method to clean any dirt which has built up on the detection window area.

- **Open the detection window and remove any yarn blockage that is present**
- **Wipe with a soft, dry or damp cloth**

* If the dirt or buildup is difficult to remove, use hot water.



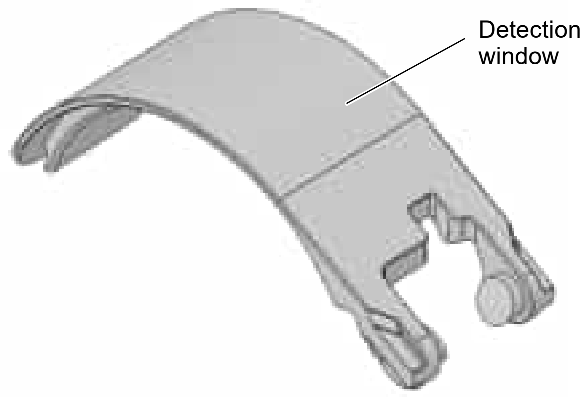
CAUTION

- If the detection window is damaged, it may not operate properly. Therefore, do not use any hard or sharp objects, etc., when cleaning.
- Do not use any petroleum solvents (such as Zippo oil).

Sec 3 Consumables

If the dirt cannot be removed even after cleaning the detection window and the upper yarn can still not be detected, please replace with a new part.

* When removing, completely open the detection window, and remove in the circumferential direction to ensure the hinge does not catch on anything.



CAUTION

If excessive force is used to remove the window, the hinge may be damaged.

Chapter

5Aa Air Piping (System Line)

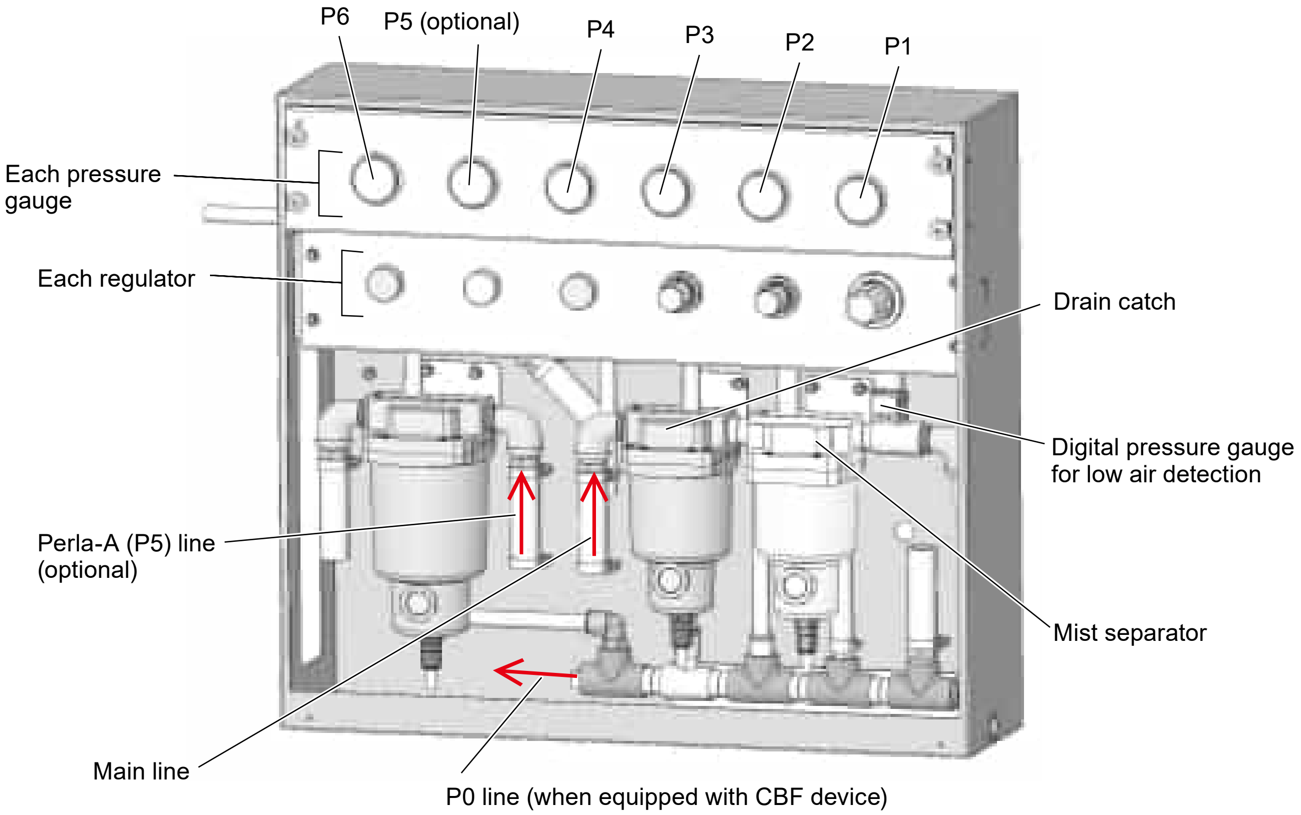
In this specification, P2 (for splicing) and P4 (for contact pressure adjustment) are the same for all winding units.

Names of Each Part

- **Regulator**

All regulators on the system line* are set up in the regulator box located on the back side of the blower box. For L machines, P1 through P6 are positioned in sequential order from the control box side (right side when facing it). [Optional specification for P5 (Perla-A)]

* System line' refers to a singular piping system shared by all devices throughout the machine setup.


P6
P5 (optional)
P4
P3
P2
P1
Each pressure gauge
Each regulator
Drain catch
Digital pressure gauge for low air detection
Perla-A (P5) line (optional)
Mist separator
Main line
P0 line (when equipped with CBF device)

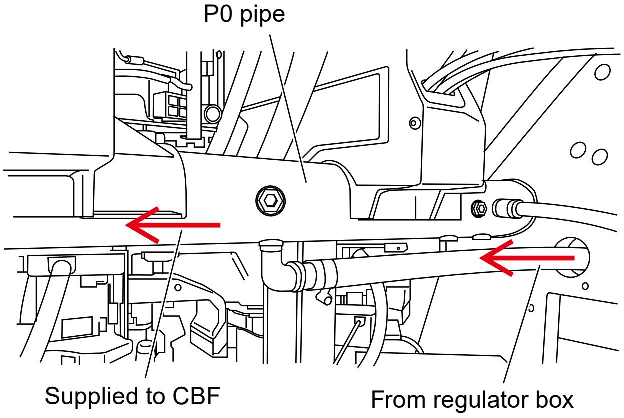
Sec 1 Adjustment Standard

1-1 Air Line

The system for the air lines is made up of a main line (P1, P2, P3, P4 and P6) and the Perla-A (P5) line.
In addition, when equipped with a CBF device, the piping runs from the end of the main line through the P0 pipe (unit).
For each line, air is supplied to each pipe behind the regulator and the unit. (Refer to Chapter 4 for further details on each item)

P0 Line

Air is supplied from the P0 pipe to the CBF side.
P0 line supply parts of the first winding unit span are shown in the figure on the right (back side of the machine).



Application & Pressure Setting Guideline for Each Pipe

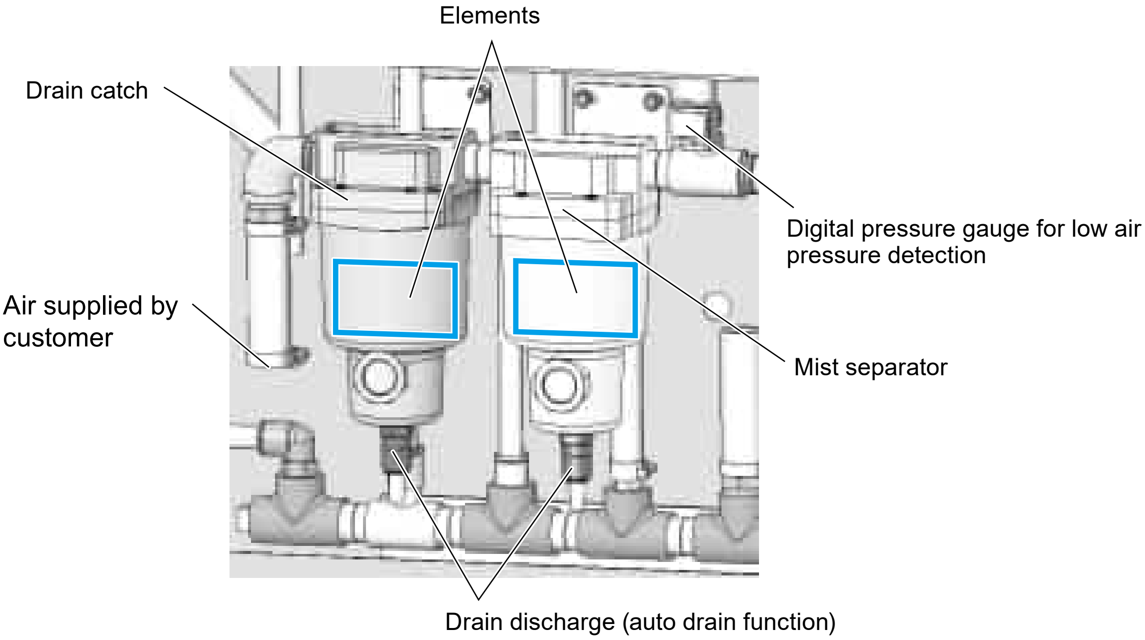
Pipe type	Regulator quantity	Application	Pressure setting
P0	None	Conveyor blast, CBF	Air pressure supplied and set by factory
P1	1 per machine	Splicer untwisting, Cleaning blast, Package conveyor, Dust collector, AD	Fixed: 0.65 MPa
P2		Splicer splicing	Setting range: 0.3 to 0.65 MPa * Adjustment depends on yarn type
P3		Contact pressure, Cradle lifter, Package brake, Bal-Con cutter, Magazine cutter, Blowing up	Fixed: 0.35 MPa
P4		Contact pressure adjustment	About 0.1 MPa * Adjustment depends on winding conditions
P5		Perla-A (optional)	About 0.2 MPa * Adjustment depends on hairiness of yarn
P6		Take-up tube support	Fixed: 0.1 MPa

Sec 2 Maintenance

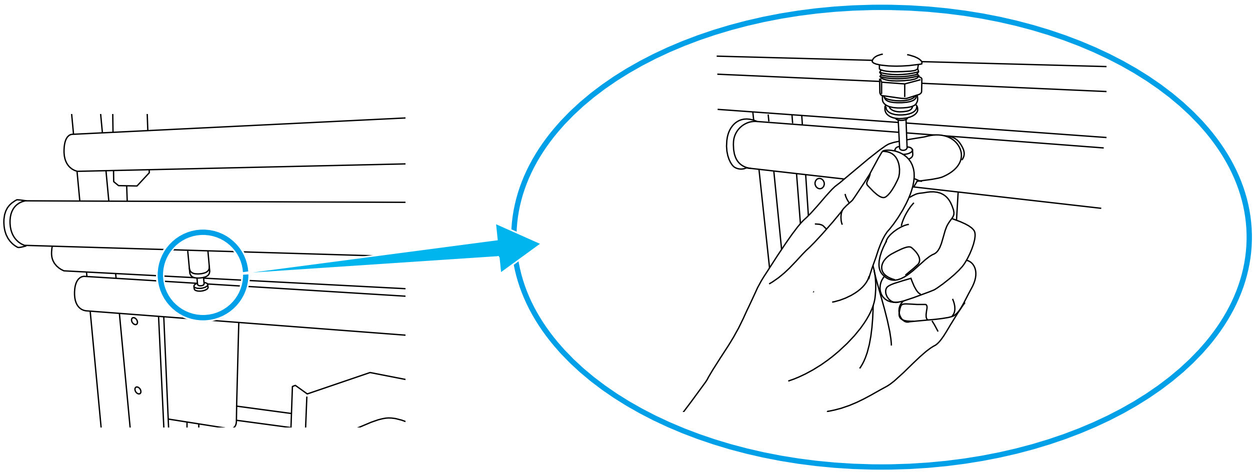
Perform regular inspections and cleaning following the table below in order to maintain stable air flow.

Frequency	Item	Guideline
Weekly	Drain discharge inspection for drain catch and mist separator	Check whether the drain catch and mist separator perform the draining operation automatically * This product has an auto drain function and drains automatically. Check to make sure.
	Drain discharge for each pipe	Remove the plug on the out-end span section behind the unit, and drain each pipe
Every 6 months	Low air pressure check on main line	Replace the drain catch and the mist separator on the main line when the following conditions apply - When there is a difference of 0.1 MPa or greater between the air pressure supplied by the customer and the digital pressure gauge reading on the regulator box - After 2 years of use
Every 2 years	Replace element (Due to time-related deterioration)	

2-1 Drain Catch & Mist Separator


Elements
Drain catch
Digital pressure gauge for low air pressure detection
Air supplied by customer
Mist separator
Drain discharge (auto drain function)

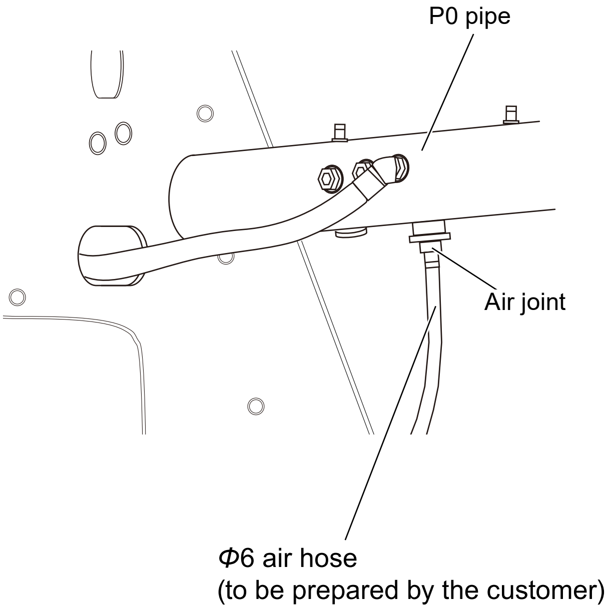
2-2 Drain Discharge For Each Pipe



2-3 P0 pipe drain discharge (only for Bobbin Tray and Link Coner)

Insert a Φ6 air hose (to be prepared by the customer) into the air joint attached to the CBF end of the P0 pipe and remove the drain.

* When inserting and removing the external diameter Φ6 air hose, cover the air joint section with a cloth so that the drain does not fall into the machine.


P0 pipe
Air joint
Φ6 air hose
(to be prepared by the customer)

Sec 3 Consumables

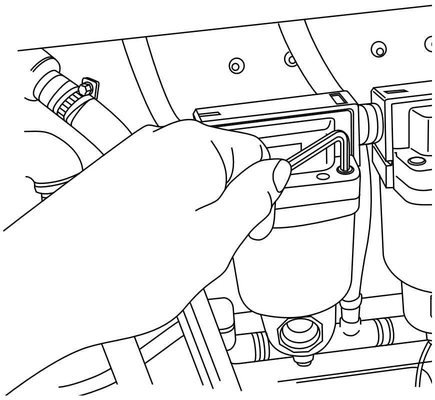
If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.

CAUTION

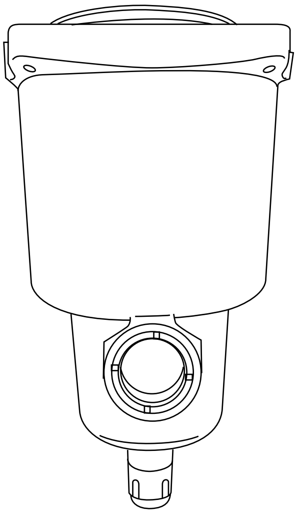
Always check that there is no air inside first before performing the replacement.

Element Replacement Method

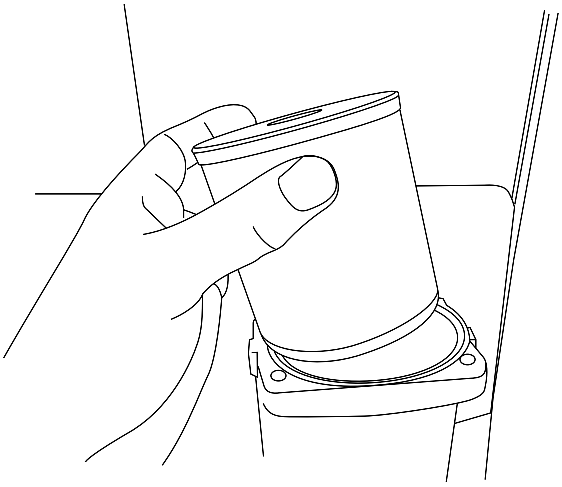
1. **Remove the screws for the drain catch and the mist separator.**



2. **Remove the lower half of the component.**



3. **Remove the element from inside and replace.**



5Ba Blower (Individual)

Sec 1 Adjustment Standard

1-1 VOS Settings

Check the static pressure gauge connected to the out-end, determine the appropriate static pressure or frequency based on yarn type, yarn count, machine operating status and other factors, and input in VOS.

Blower control method	Select blower control method •Static pressure control：Feedback control which utilizes the out-end static pressure gauge. Set the required static pressure. •Speed control：Enter the blower speed (upper limit and lower limit settings).
Blower static pressure	Set the static pressure for normal operation *Only when “Static pressure control” is selected for the blower control method
Blower static pressure (High)	Set the static pressure for sequential startup *Only when “Static pressure control” is selected for the blower control method
Blower speed (Upper limit)	Set the frequency for sequential startup *Only when “Speed control” is selected for the blower control method
Blower speed (Lower limit)	Set the frequency for normal operation *Only when “Speed control” is selected for the blower control method
Blower acceleration time	Set the blower acceleration time for operation start
Blower wait control	Select “OFF”, “At start”, “At stop” or “At start&stop“ *The blower can be operated at a low frequency at which there is just enough suction from the magazine can head to pull the yarn end when bobbins are supplied at startup or when stopping.
Blower speed (During wait control)	Set the frequency for blower wait control *Only when something other than OFF is selected for blower wait control
Blower static pressure alarm	Select whether to detect static pressure decrease alarms *Only when “Speed control” is selected for the blower control method
Blower static pressure alarm level	Set the static pressure decrease alarm level *Only when “ON” is selected for the blower static pressure alarm

Sec 2 Maintenance

Perform regular inspections and cleaning following the table below to ensure that the blower functions properly.

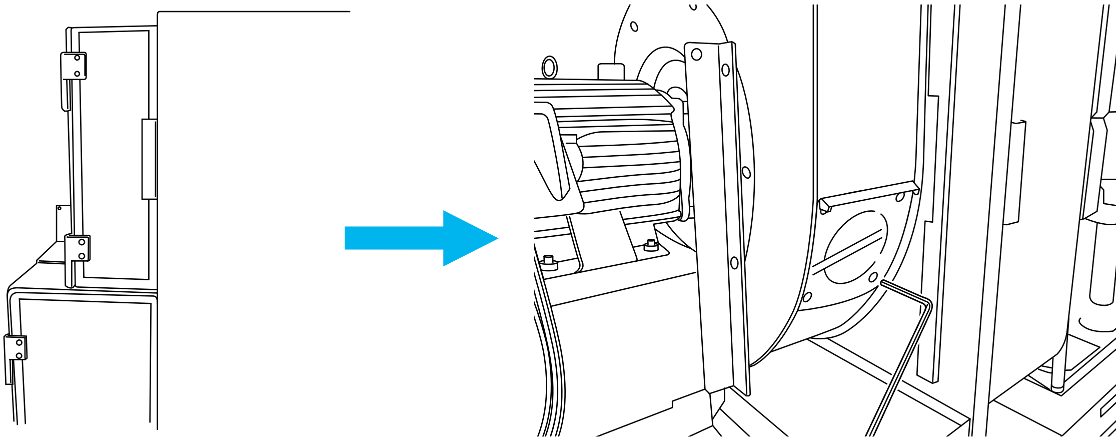
Frequency	Item	Guideline
Monthly	Impeller	Clean off the cotton fly buildup * Refer to the cleaning procedure below
Every 3 months	Impeller	Remove dust and cotton dust buildup *Clean the impeller blades using an air gun (Use only dry air)

2-1 Impeller Cleaning

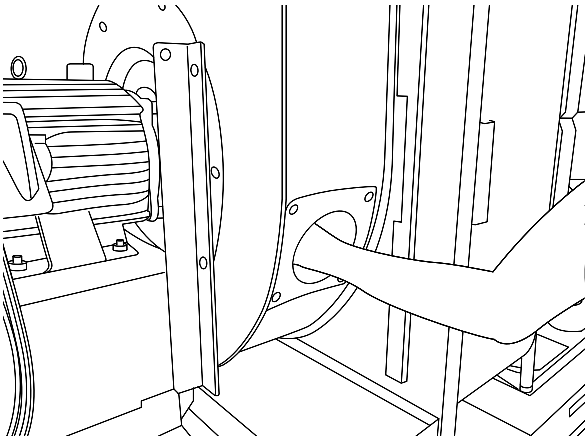
CAUTION

First check that all machine operations have stopped completely before cleaning.
Open the front door to the blower box, and check whether the impeller is rotating by looking through the cotton fly removal window.

1. **Open the cotton fly removal window.**



2. **Remove the cotton fly with your hands.**

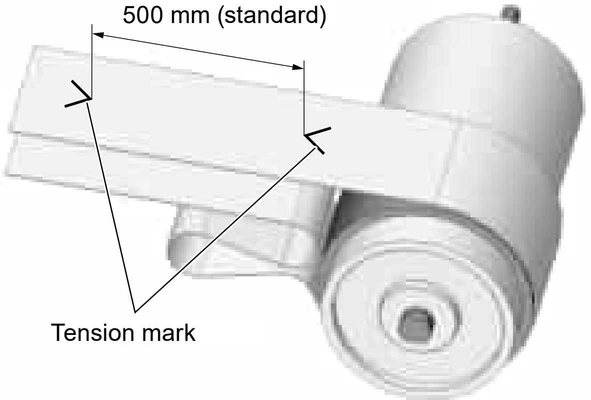


Sec 1 Adjustment standard

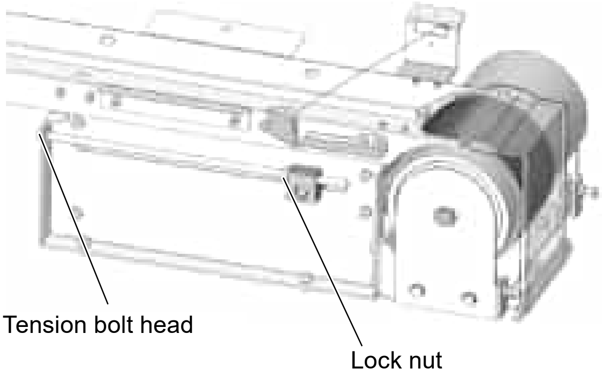
1-1 Belt tension

The belt tension ratio should be between 0.6% and 0.8%.
Refer to the tension marks provided as shown in the diagram on the right. Measure the appropriate length with a tape measure and tighten.

The standard length (inside dimension) between the tension marks is 500 mm.
Ex:
If the length between the tension marks is 503 mm after tightening, the tension ratio is 0.6% [(503 - 500) / 500 × 100].



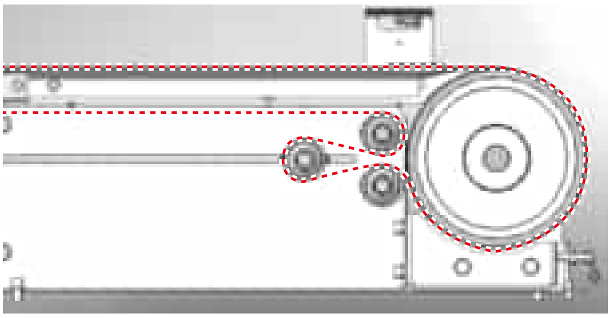
1. **Loosen the lock nut.**
2. **Adjust the tension by rotating the head of the tension bolt with a wrench (17 mm).**



Belt Attachment

Attach the belt as shown in the figure to the right and adjust the tension.

- Tension flows towards the motor side, so adjust the tension to 0.6 %.
- In cases where the package will flow in the opposite direction of the motor, adjust the tension to 0.8%.

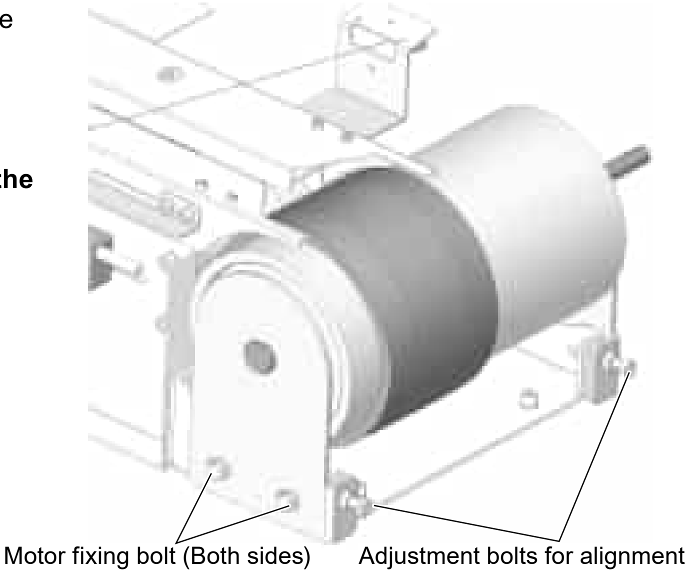


1-2 Adjusting the Belt Alignment

Motor side

Adjust the alignment by screwing in or unscrewing the bolts on the right and left sides.

1. **Motor fixing bolt1. Loosen the fixing bolts (both sides) for the motor.**
2. **Align the belt by screwing in or unscrewing the adjustment bolts.**

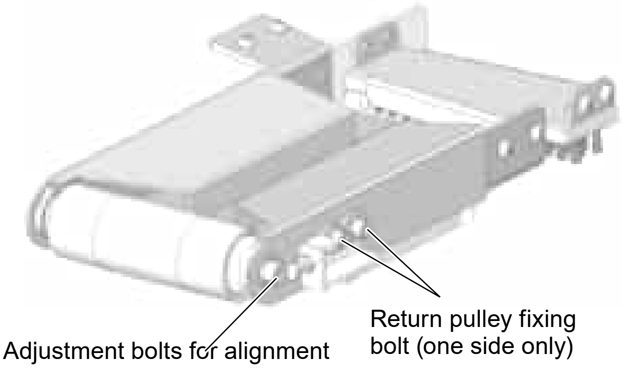

Motor fixing bolt (Both sides)
Adjustment bolts for alignment

Out-end (Return) Side

Adjust the alignment by screwing in or unscrewing the

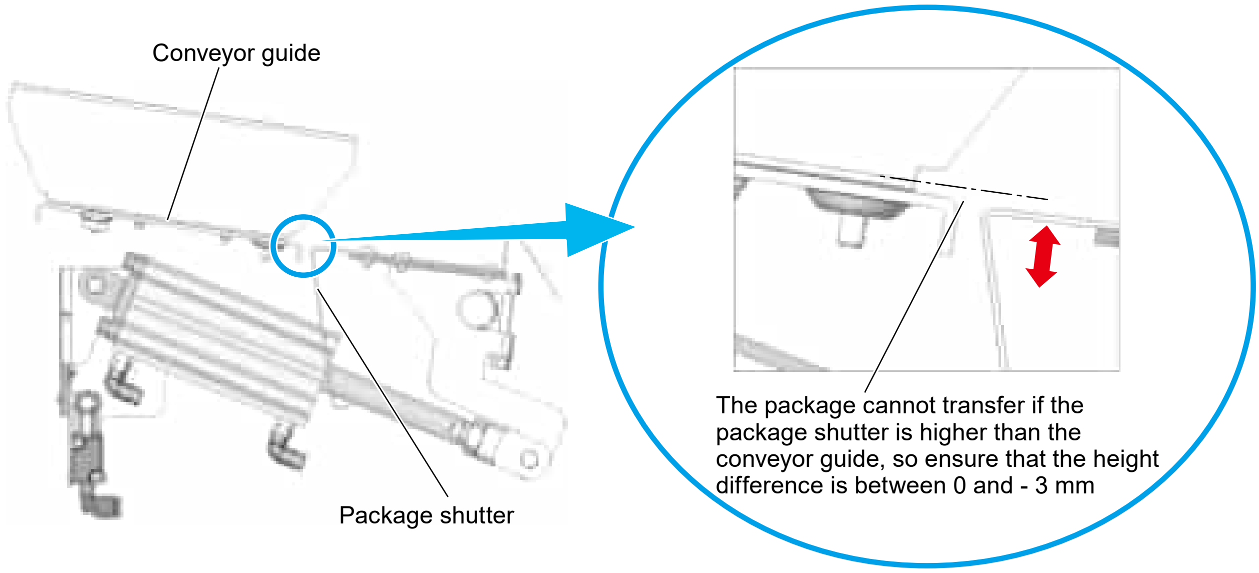
adjustment bolt.

1. **Loosen the fixing bolts (one side only) for the return pulley.**
2. **Align the belt by screwing in or unscrewing the adjustment bolts.**


Adjustment bolts for alignment
Return pulley fixing bolt (one side only)

1-3 Package shutter

Stop the machine, ensure that there is no air inside the package shutter, and adjust.
Fully extend the package shutter, and adjust the package shutter so that the difference in height between the shutter and the conveyor guide is 0 to - 3 mm.


Conveyor guide
Package shutter

The package cannot transfer if the package shutter is higher than the conveyor guide, so ensure that the height difference is between 0 and - 3 mm

1-4 VOS settings

The VOS settings are listed below. Change the setting conditions when necessary.

Package Conveyor Drive	Select "Manual" or "Auto"
Package Conveyor Mode	Select "Standard" or "PackageCheck"
Package conveyor transport speed	Set transport speed
Package conveyor alarm	Set the required time
Package C/V Auto Start	Set the required time for auto drive
Pkg C/V Flow Direction	Select the flow direction
Package Shutter (Span)	Set the group(s) when equipped with a shutter

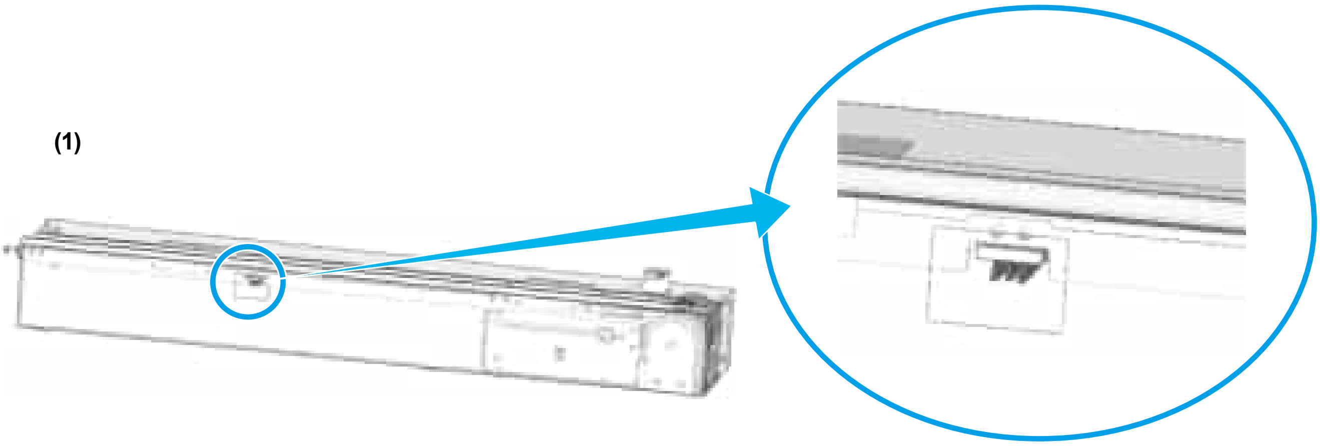
Sec 2 Maintenance

2-1 Inspection & cleaning

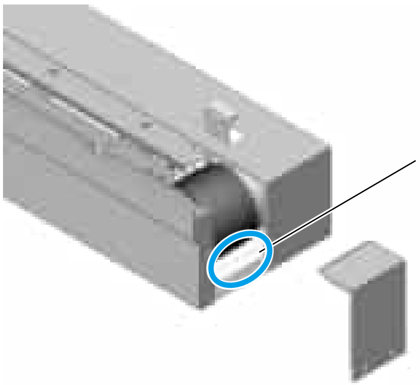
A build up of yarn waste leads to motor damage and belt cracking.

Frequency	Item	Guideline
(1) Weekly	Conveyor brush	Remove the conveyor brushes on both ends, and remove any yarn waste that is stuck to it
(2) Monthly	Remove cotton fly	With machine operation stopped, remove the drive-end side cover and remove any cotton fly buildup inside

(1)



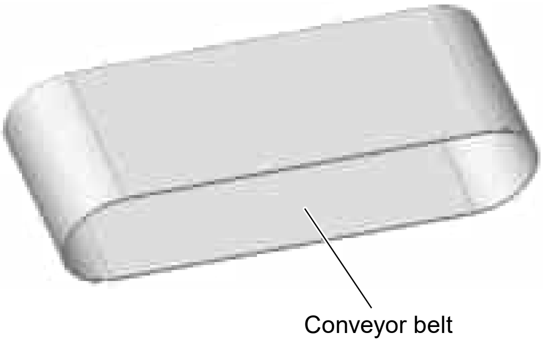
(2)

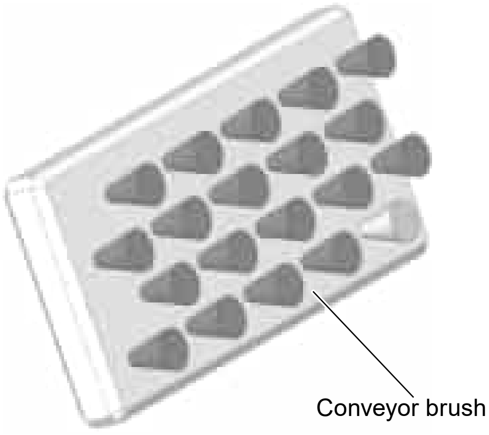


Remove cotton fly buildup from this location

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.





Sec 4 Transport weight capacity

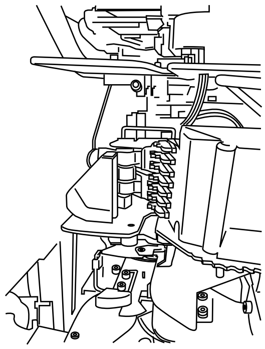
The weights which the package conveyor is capable of transporting at one time are listed below.
Please do not attempt to transport packages which are heavier than the maximum weight.

- 280 kg when packages flow towards the motor side
- 210 kg when packages flow towards the side opposite the motor

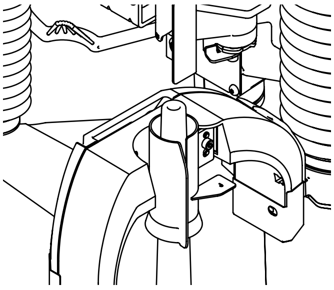
Chapter 5Da Dust Collector

Names of Each Part

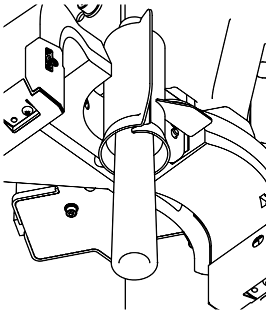
- **Suction nozzle (on each winding unit)**



Gate tensor



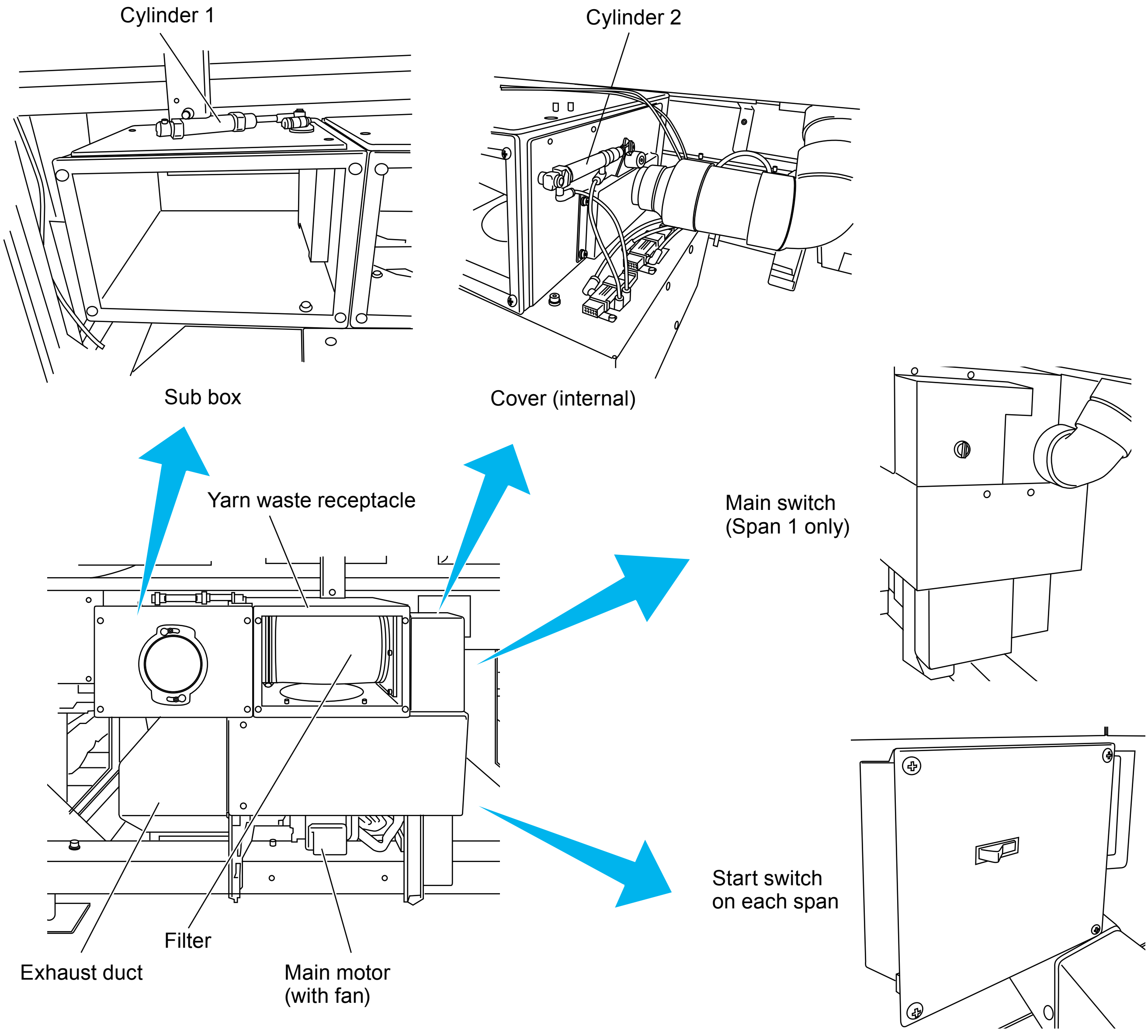
Upper part of Bal-Con



Lower part of Bal-Con

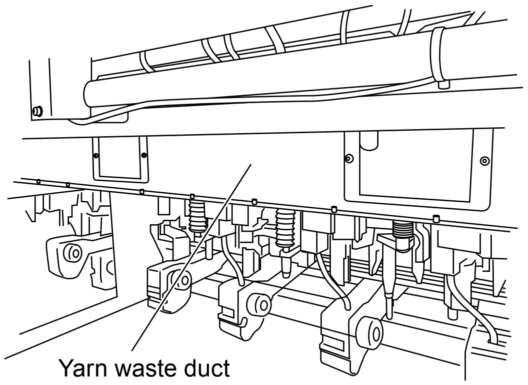
- **Fan motor for yarn waste (on each span)**

The fan blows the cotton fly which collects at the filter and holds it here in this space provided. After the cotton fly is held for a certain amount of time, it is sent to the yarn waste receptacle.


Cylinder 1
Cylinder 2
Sub box
Cover (internal)
Yarn waste receptacle
Main switch
(Span 1 only)
Start switch
on each span
Filter
Exhaust duct
Main motor
(with fan)

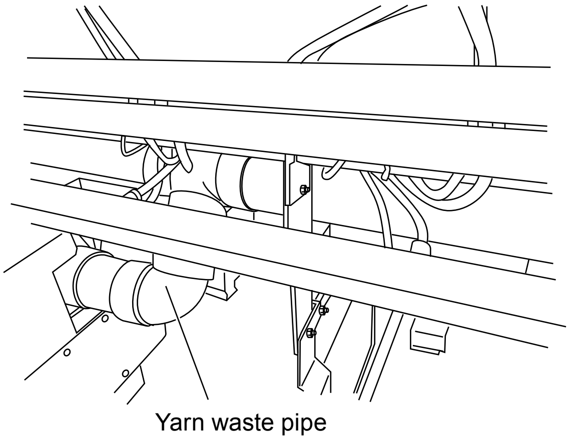
- **Yarn waste duct (on each span)**

The cotton fly is sucked up by the suction nozzle on the winding unit, passes through this duct and is sent to the yarn waste receptacle.

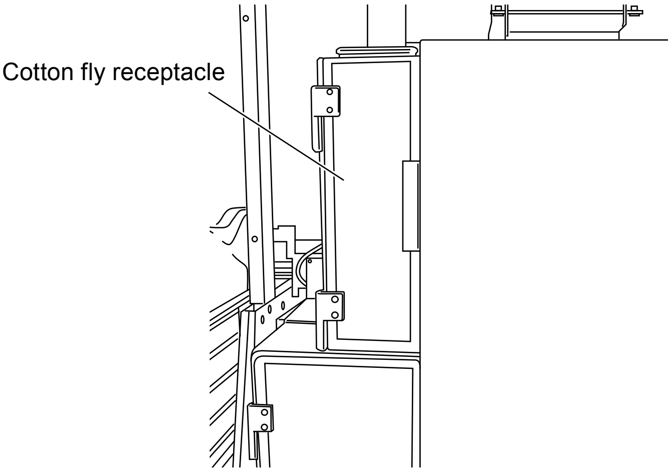


- **Yarn waste pipe**

After the cotton fly builds up in the yarn waste receptacle for a certain amount of time, it is released and sent through this pipe before being collected at the cotton fly receptacle on the blower.



- **Cotton fly receptacle**



Features

The suction nozzle sucks up the cotton fly that is being generated while being wound onto the spinning bobbins for each winding unit.

The cotton fly, which is sucked out from each winding unit, is first collected at the yarn waste receptacle on the back side of the machine. Then, it passes through the yarn waste pipe to be collected at the cotton fly receptacle on the blower at regular intervals.

The fan motor operation can be started and stopped using the operation switch located on the side of the yarn waste receptacle for Span 1 located on the back side of machine.

Sec 1 Adjustment Standard

The yarn waste is generally collected in 10 minute cycles.
The cotton fly may build up too much at the filter depending on the yarn type and yarn count. If this occurs, shorten the cycle time settings for the yarn waste on the VOS.

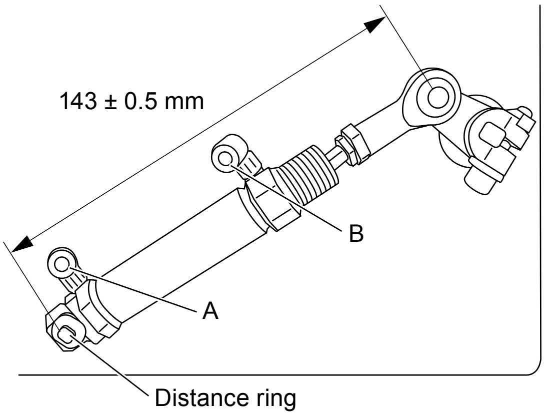
1-1 Cylinder

If the cylinder is removed for maintenance, adjust the length of the cylinder as shown in the diagram below when re-attaching.
When removing the cylinder, make sure that you do not lose or misplace the distance ring for each support.

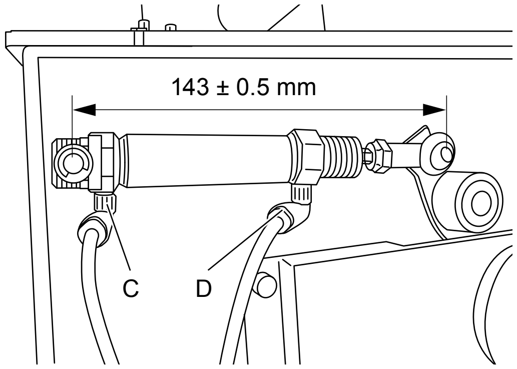
CAUTION

When adjusting the cylinder, always make sure that there is no air inside it.

- **Cylinder A**



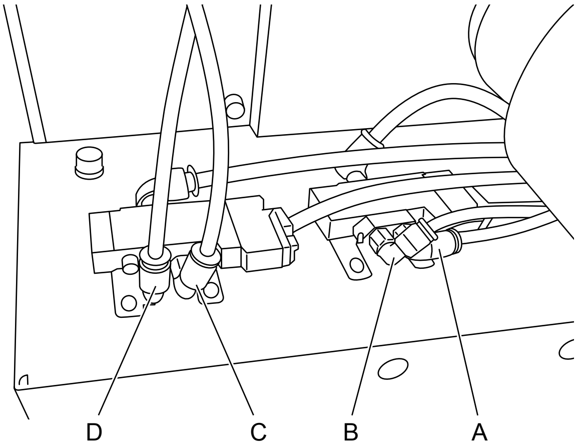
- **Cylinder B**



* When the cylinder has fully contracted, adjust the length between the cylinder's support point and the center of the hole for the rod end.

- **Air hose**

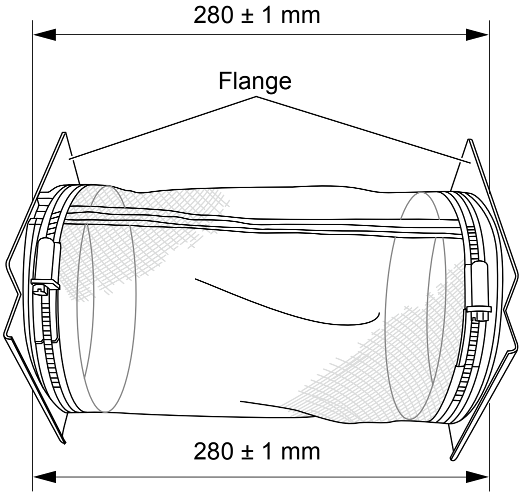
After adjusting the cylinder, connect each air hose to the corresponding solenoid valve joint.



1-2 Filter

When re-attaching the filter, adjust the flanges so that both ends are 280 ±1 mm apart on all four sides.

- * Do not remove the filter from the flanges unless you need to replace a damaged filter.



1-3 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Dust Collector Interval	Set the required time

Sec 2 Maintenance

Perform regular inspections and cleaning following the table below to ensure that the dust collector functions properly.

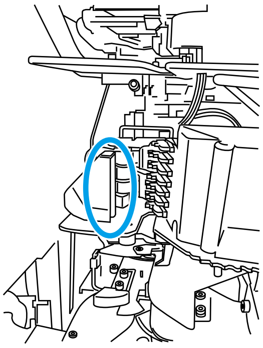
Frequency	Item	Guideline
Daily	Suction nozzles for all winding units	• Perform visual inspection to check for cotton fly buildup on nozzle • Use air gun to remove cotton fly on winding units with buildup
	Ducts for yarn waste on each span	• Perform visual inspection to check for cotton fly buildup • If there is buildup, open the check window to remove
	Filters on each span	• Perform visual inspection to check for clogging • Clean shutter if there is notable clogging
	Shutters inside the sub-boxes on each span	• Perform visual inspection to check for cotton fly buildup • Perform visual inspection to check for yarn dragging • Clean air cylinder if there is a lot of cotton fly build up or notable yarn dragging
Monthly	Suction nozzles for all winding units	Use an air gun to remove cotton fly building up on nozzle
	Filters on each span	Remove filter and use air gun to remove cotton fly buildup
	Shutters on each span	Open check window for sub-boxes and remove cotton fly build up with air gun or by hand
	Air cylinders on each span	Remove cotton fly buildup with air gun

CAUTION

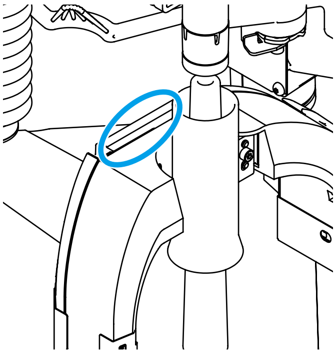
Always remove the air hose Φ6 connected to P1 for the shutter and the air cylinder to check whether the cylinder is operating or not before cleaning.

2-1 Suction Nozzle Cleaning

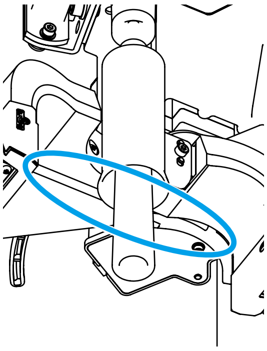
Use an air gun to remove the cotton fly buildup.



Gate tensor



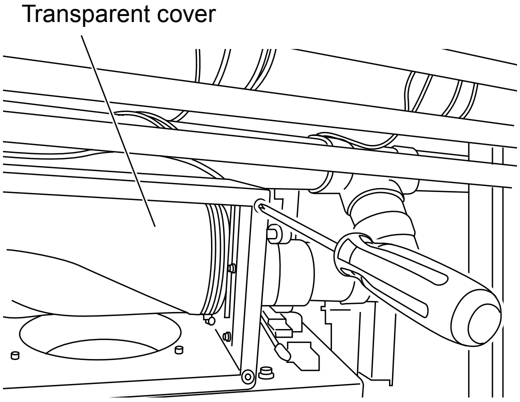
Upper part of Bal-Con



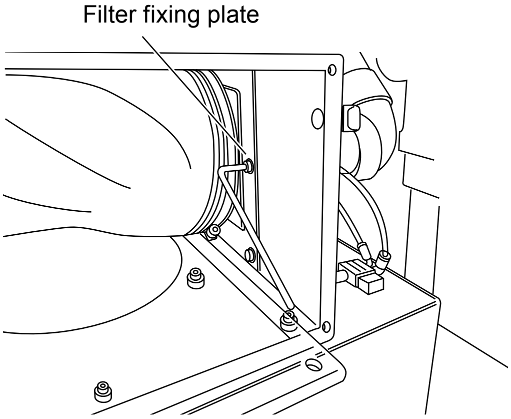
Lower part of Bal-Con

2-2 Filter Cleaning

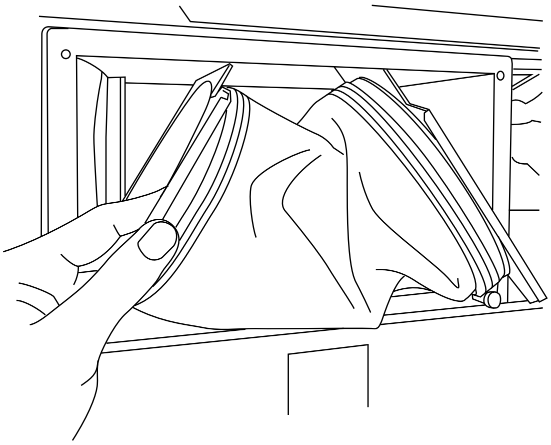
1. **Remove the transparent cover.**


Transparent cover

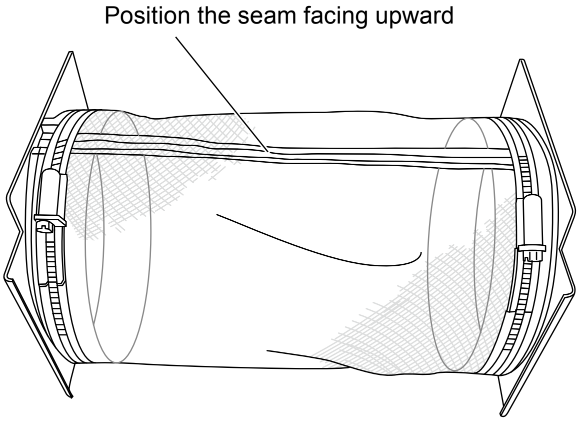
2. **Remove the plate that fixes the filter in place.**
   * Put the transparent cover down without letting the screws fall out.


Filter fixing plate

3. **Remove the filter.**



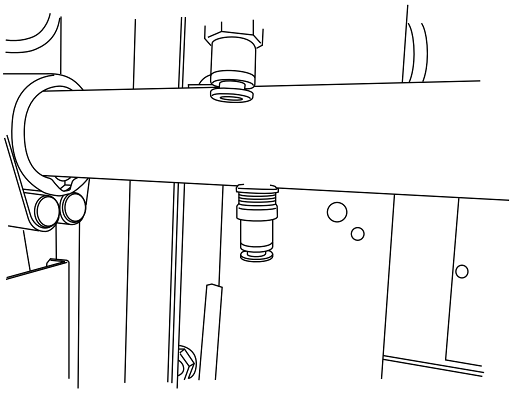
4. **Check if the filter is damaged and use an air gun to remove any cotton fly that is stuck to it.**


Position the seam facing upward

2-3 Shutter Cleaning

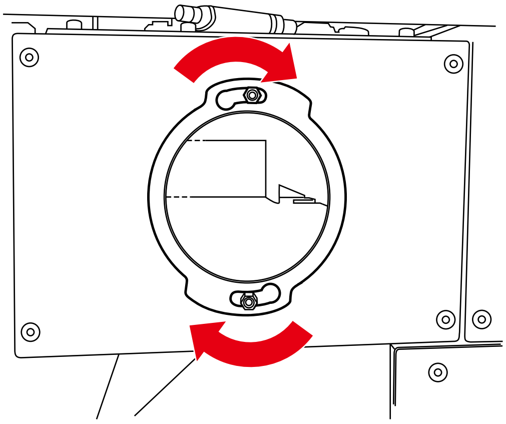
1. **Purge the air from the cylinder.**

   * Even if the air hose is disconnected, air will not leak out because there is a check valve.



2. **Turn the transparent cover on the sub-box in the direction of the arrow to open.**

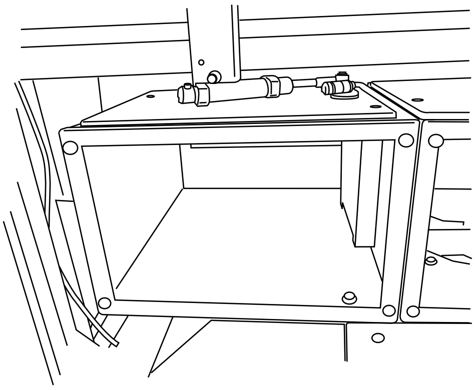
3. **Use an air gun or your hands to remove any cotton fly or yarn stuck to the shutter.**



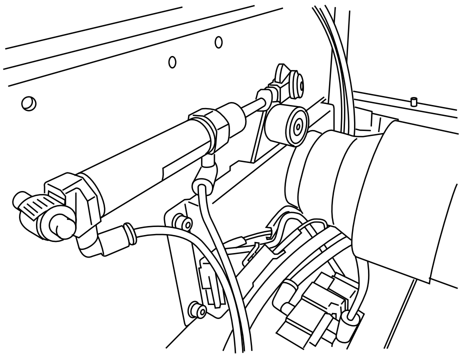
2-4 Air Cylinder Cleaning

Use an air gun to remove the cotton fly buildup.

* Open the cover and clean cylinder 2.



Cylinder 1



Cylinder 2

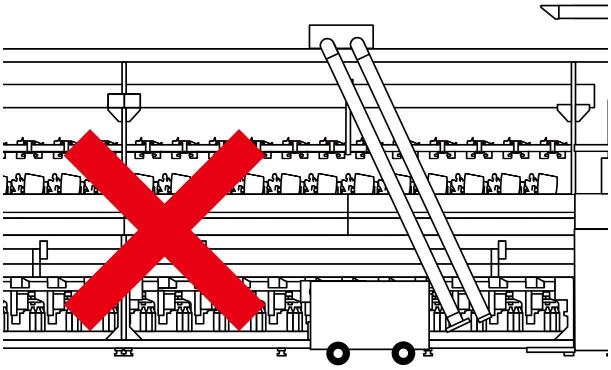
Chapter
5Ea Blow Cleaner

Introduction

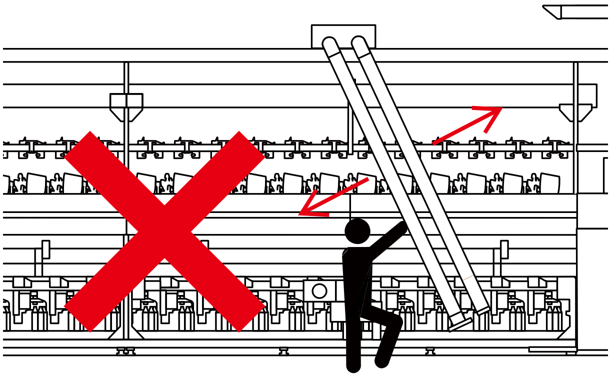
- **Precautions**

Ensure the following items when operating the blow cleaner.

- Do not place bobbin boxes, carts, or other items that could become obstacles on the track when travelling.



- Do not shake the blow pipe or suction hose.



CAUTION If the above items are not observed, problems will occur with the blow cleaner travel.

Sec 1 Mechanism

1-1 Each Mechanism

- **Main unit area**

Consists of the suction casing (with filter attached), the blow casing (with impeller), the differential pulley, and the belt shift mechanism.

- **Blow/suction area**

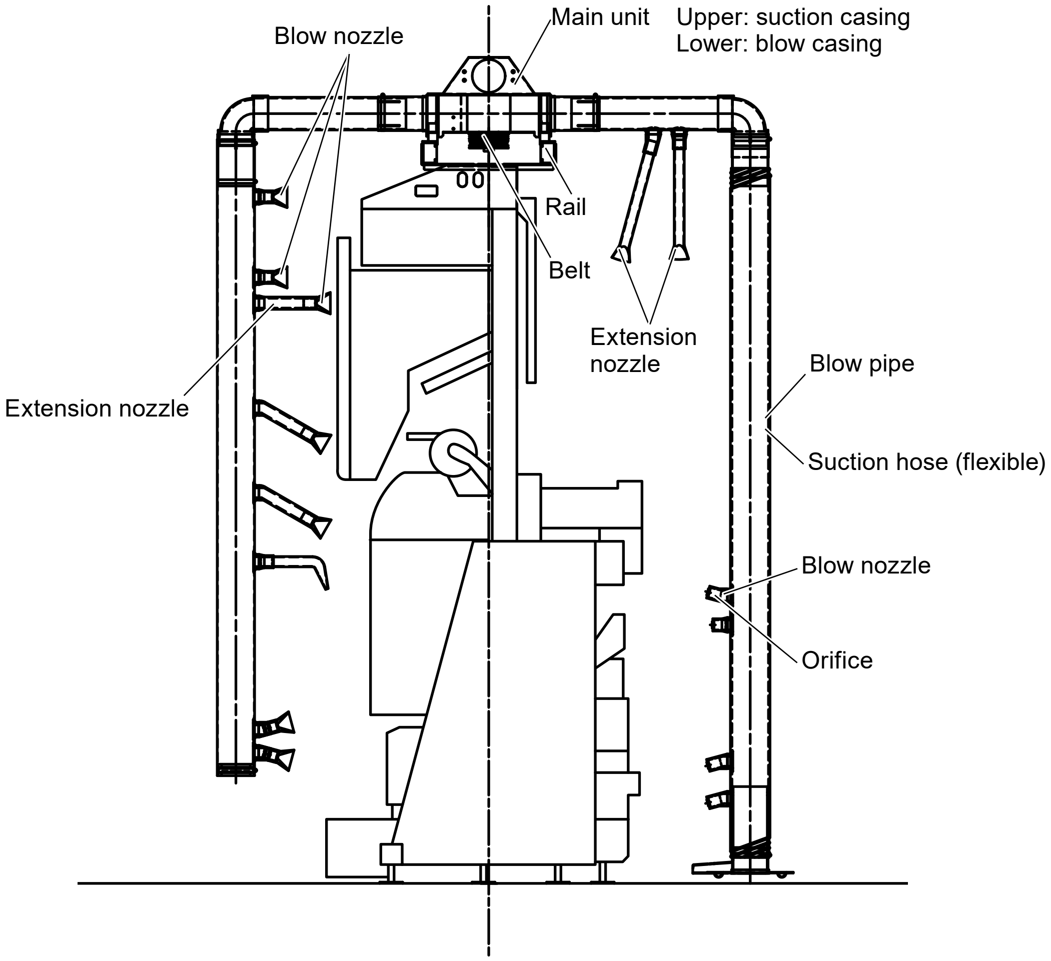
Consists of blow pipe (the blow hose), the blow nozzle, the suction hose, and the suction nozzle.

- **Travelling part**

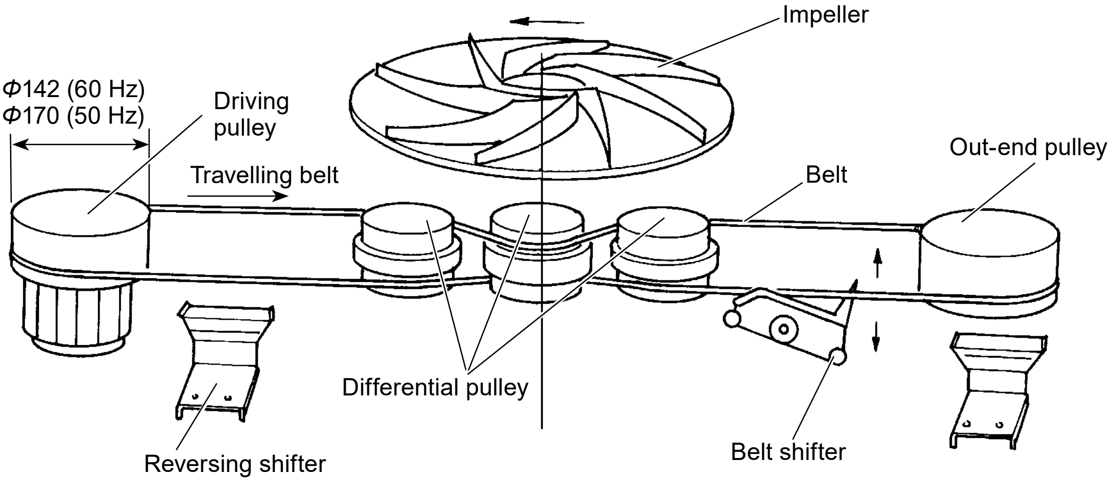
Consists of the drive section, the out-end pulley, the belt, the reversing shifter, and the filter cleaner unit.

- **Cotton fly collector device**

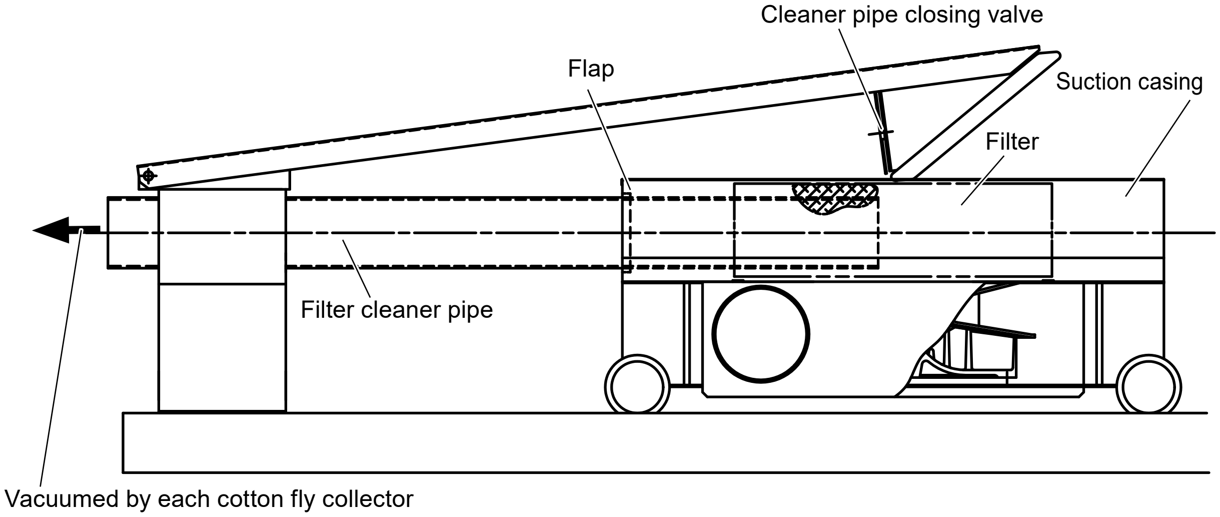
1-2 Illustration of the Structure Surrounding the Blow Cleaner


Blow nozzle
Main unit
Upper: suction casing
Lower: blow casing
Rail
Belt
Extension nozzle
Extension nozzle
Blow pipe
Suction hose (flexible)
Blow nozzle
Orifice

1-3 Driving Mechanism


Φ142 (60 Hz)
Φ170 (50 Hz)
Driving pulley
Travelling belt
Impeller
Out-end pulley
Belt
Differential pulley
Reversing shifter
Belt shifter

1-4 Cotton Fly Collecting Mechanism

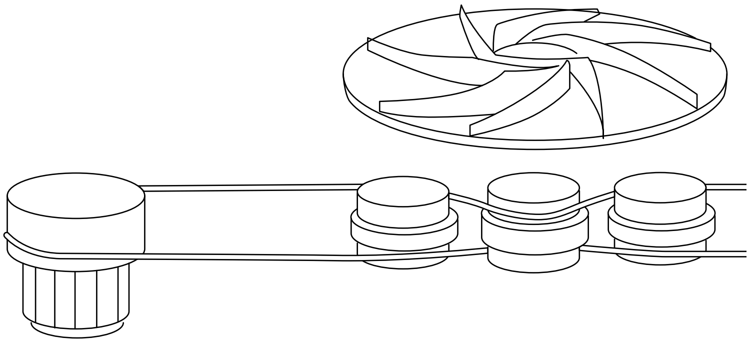

Cleaner pipe closing valve
Flap
Suction casing
Filter
Filter cleaner pipe
Vacuumed by each cotton fly collector

Sec 2 Maintenance

Frequency	Item	Guideline
Regularly	Main units	- Check the impeller pulley, differential pulley, and belt shifter - Ensure that the screws and hose band are tight
	Drive section, out-end section	- Check for any looseness of the screws on the out-end pulley and motor pulley - Check the position of the reversing shifter and for any looseness of its screws - Remove cotton fly from around the motor
	Rails	- Check for any looseness of the bolt nuts on the pillar, the stay and so on - Check for any irregularity on the rail joints
	Pipes	- Check around the pipes - Repair the curve and angle of the blow pipes - Check the nozzles (and replace If any are missing)
	Belts	- Check the belt for any slack and damage (wear, cracking, tearing, peeling, etc.) - Check that there is no travel error (traveling in the reverse direction when starting, etc.). - Inspect to see if the belt is attached correctly (Refer to 1-3 Driving Mechanism). - Inspect the belt attachment in the same manner after power outages and momentary power loss.
	Bearings (bearing with a seal)	Check for the motor shaft, out-end pulley, impeller pulley, differential pulley, and wheels. * Since all fast-rotating parts use bearings, daily oil replenishment is not required.
Monthly	Filter	Because the filter filters cotton and other dusts, it becomes soiled and clogged after being used for a long period. Please check the condition of filter soiling periodically after the machine is installed and determine the appropriate cycle for replacement and cleaning. (In practical terms, the cycle differs completely, depending on the types of yarn and fiber used, the operating conditions and so on, so please determine based on your experience.) **● Replacement and Cleaning** **1.Prepare a spare filter.** **2.After replacement, wash the filter removed with water and mild detergent, and allow to dry naturally.** * Since the condition of the filter significantly affects the performance of the blow cleaner, early replacement is necessary
Every 6 months	Pipes	- Check, disassemble and clean the pipes (primarily the blow pipe) - Cotton fly accumulates on the upper side of the blow pipe and the pipe joints. Carefully remove the fly without damaging the blow - Remove the cotton fly from the suction hose in the same way
	Main unit area	Disassemble the main unit casing and clean out any contaminating cotton fly, cotton dust and so on from inside

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.



CAUTION

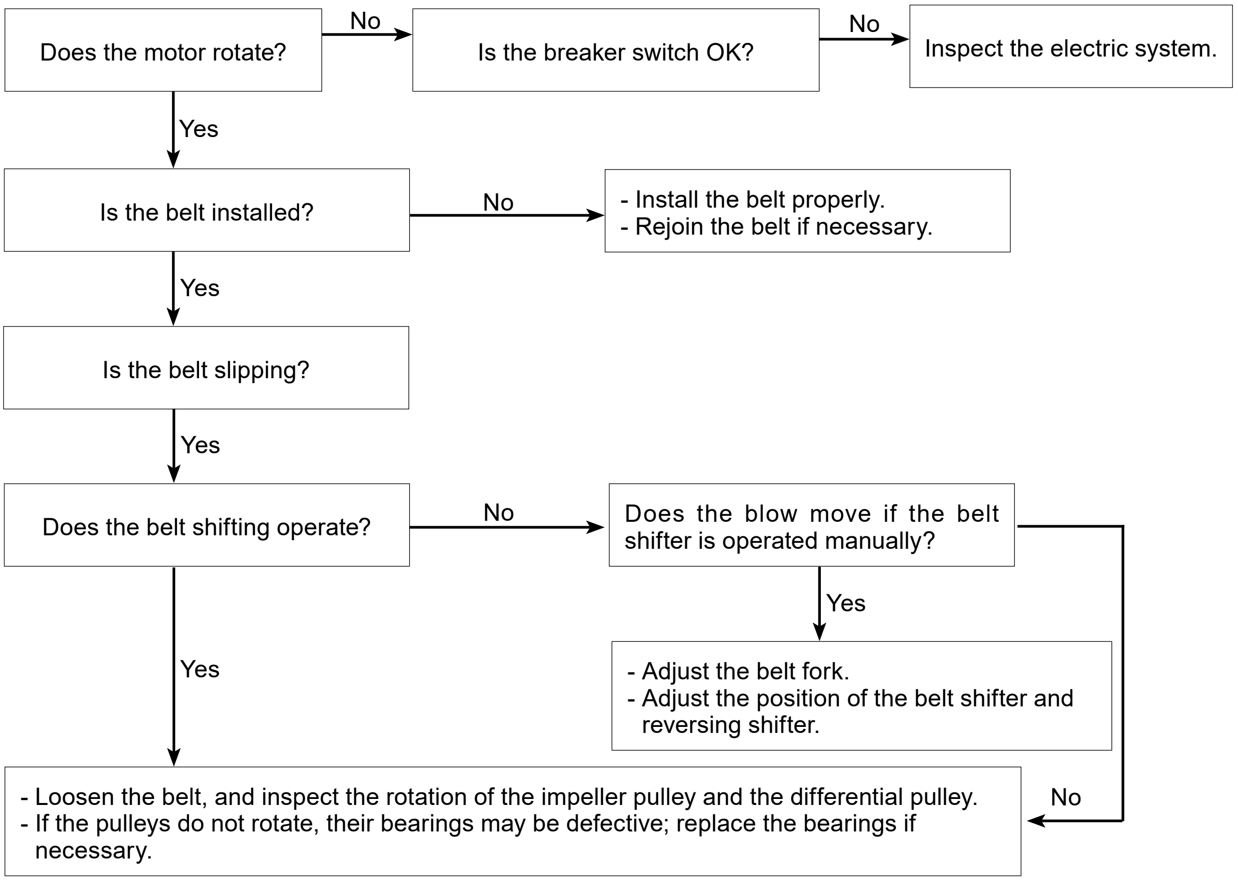
Use a Habasit S-18/20 for the belt.
Replace the belt in the following circumstances.

- When used continuously for three years or more.
- When there is any damage (wear, cracking, tearing, peeling, etc.)
- When it travels for 5 cm or more in the reverse direction when starting.

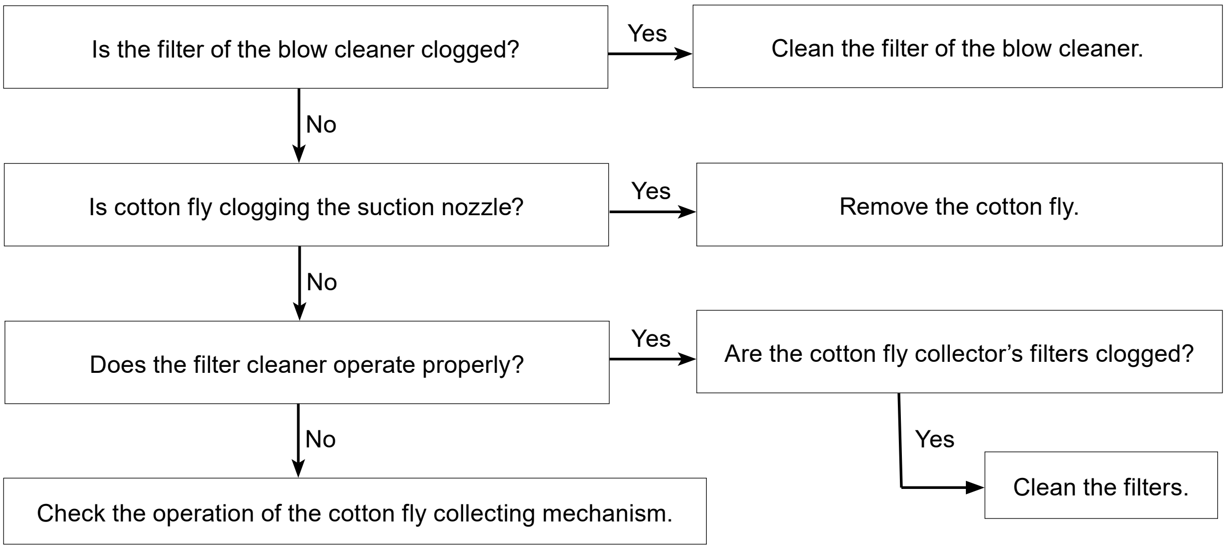
Sec 4 Troubleshooting

When the problem below occurs, please perform the following check.

4-1 The Blow Cleaner Does Not Move


Does the motor rotate?
No
Is the breaker switch OK?
No
Inspect the electric system.
Yes
Is the belt installed?
No
- Install the belt properly.
- Rejoin the belt if necessary.
Yes
Is the belt slipping?
Yes
Does the belt shifting operate?
No
Does the blow move if the belt shifter is operated manually?
Yes
- Adjust the belt fork.
- Adjust the position of the belt shifter and reversing shifter.
Yes
No
- Loosen the belt, and inspect the rotation of the impeller pulley and the differential pulley.
- If the pulleys do not rotate, their bearings may be defective; replace the bearings if necessary.

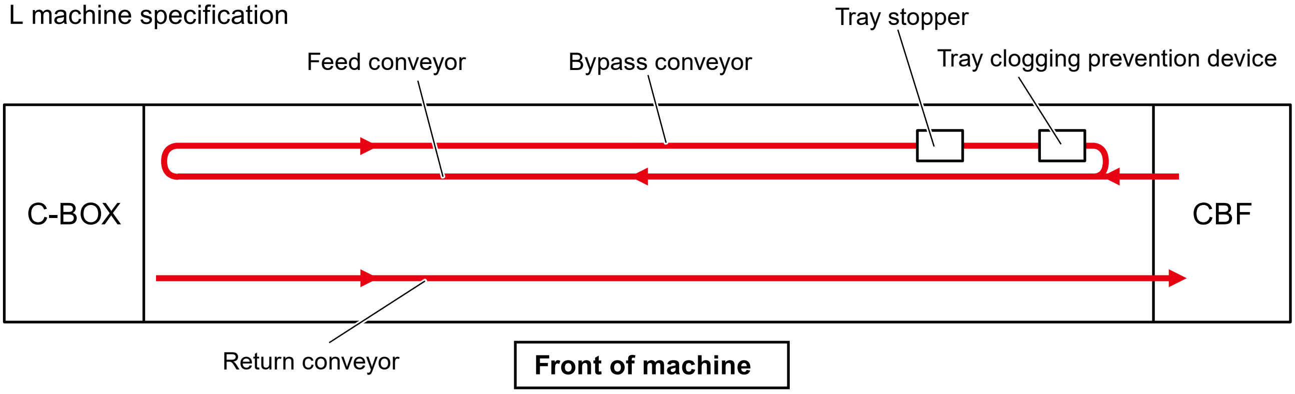
4-2 The Suction Is Weak When the Blowing Pressure Decreases


Is the filter of the blow cleaner clogged?
Yes
Clean the filter of the blow cleaner.
No
Is cotton fly clogging the suction nozzle?
Yes
Remove the cotton fly.
No
Does the filter cleaner operate properly?
Yes
Are the cotton fly collector's filters clogged?
Yes
Clean the filters.
No
Check the operation of the cotton fly collecting mechanism.

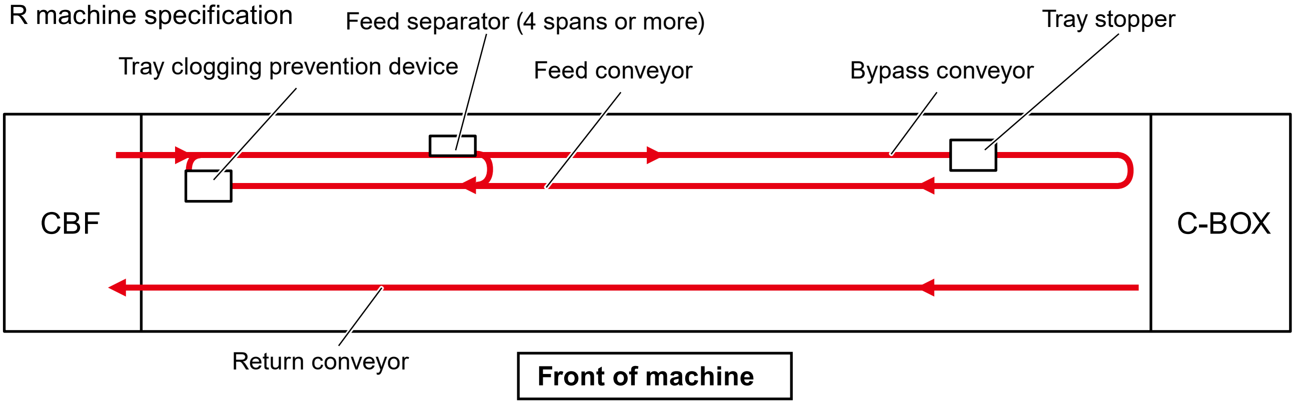
5Fa Tray Conveyor

Direction of flow for tray

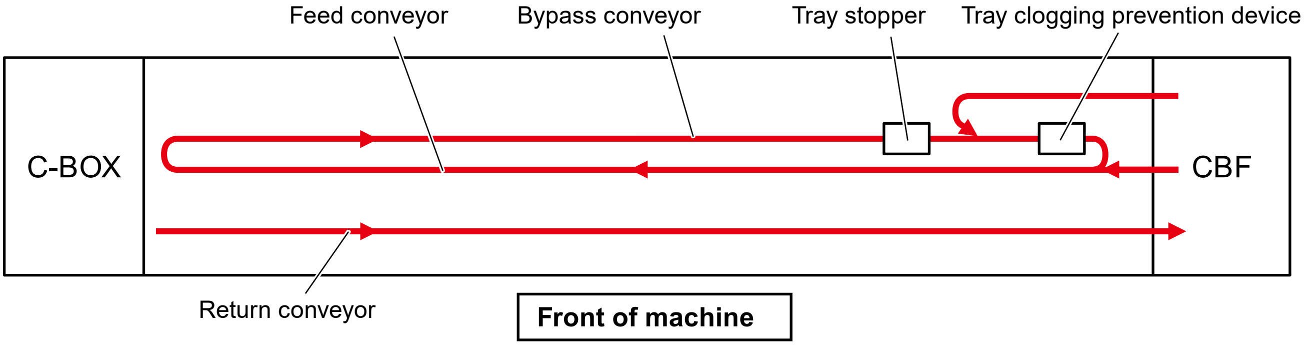
- **1 yarn type: Cop-Robo x 1**
  - L machine specification


Tray stopper
Feed conveyor
Bypass conveyor
Tray clogging prevention device
C-BOX
CBF
Return conveyor
Front of machine

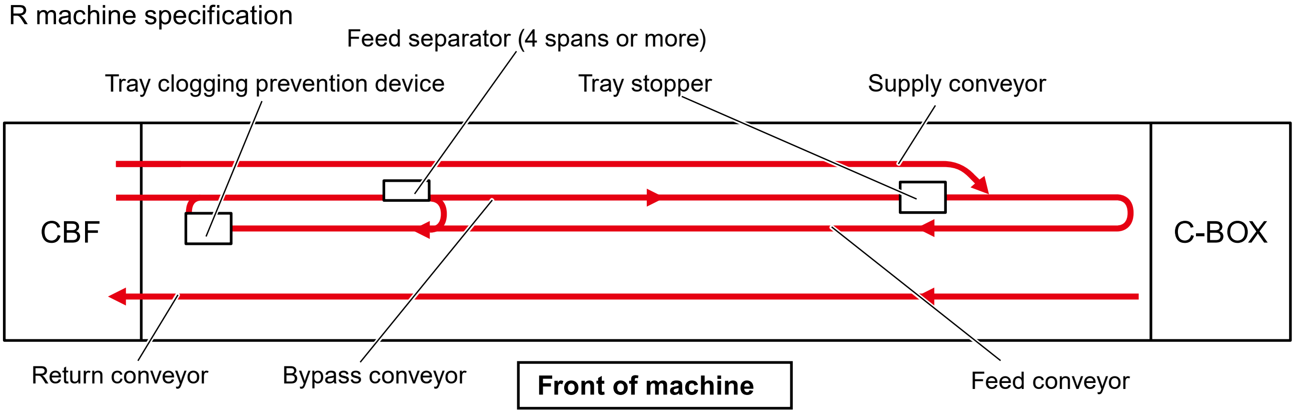
  - R machine specification


Feed separator (4 spans or more)
Tray stopper
Tray clogging prevention device
Feed conveyor
Bypass conveyor
CBF
C-BOX
Return conveyor
Front of machine

- **1 yarn type: Cop-Robo x 2**
  - L machine specification

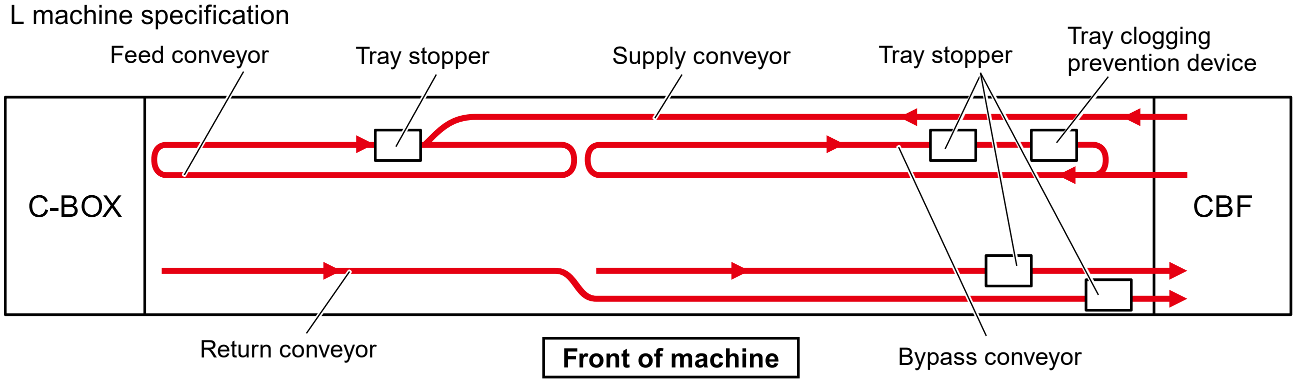

Feed conveyor
Bypass conveyor
Tray stopper
Tray clogging prevention device
C-BOX
CBF
Return conveyor
Front of machine

  - R machine specification

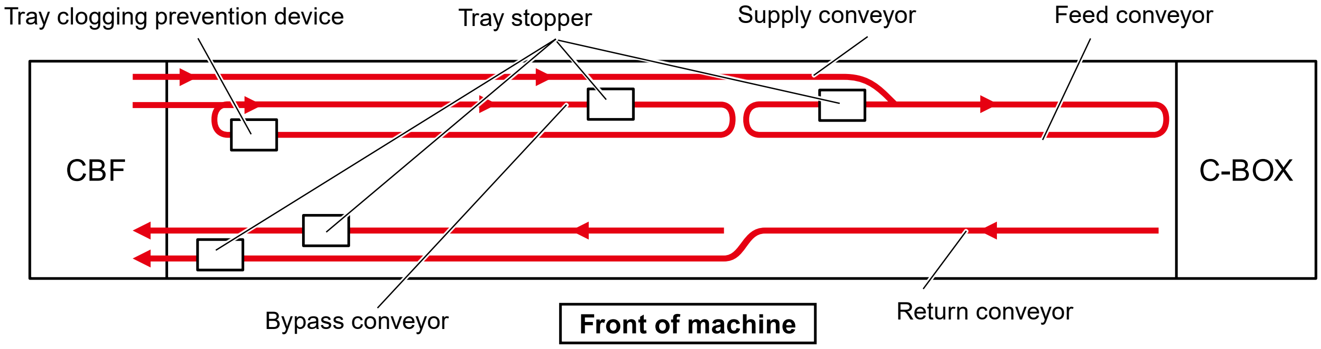

Feed separator (4 spans or more)
Tray clogging prevention device
Tray stopper
Supply conveyor
CBF
C-BOX
Return conveyor
Bypass conveyor
Front of machine
Feed conveyor

- **2 yarn type: Cop-Robo x 2**

- L machine specification

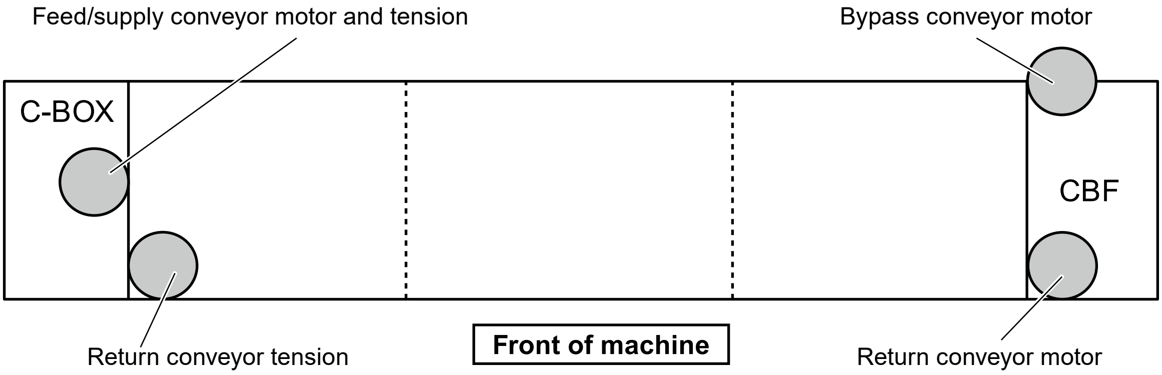

Feed conveyor
Tray stopper
Supply conveyor
Tray stopper
Tray clogging prevention device
C-BOX
CBF
Return conveyor
Front of machine
Bypass conveyor

- R machine specification

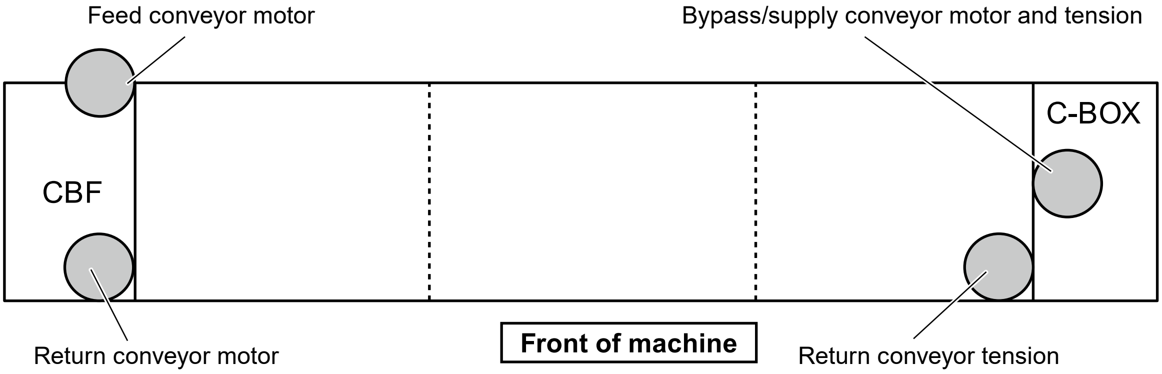

Tray clogging prevention device
Tray stopper
Supply conveyor
Feed conveyor
CBF
C-BOX
Bypass conveyor
Front of machine
Return conveyor

Location of conveyor motor & tension device

- L machine specification


Feed/supply conveyor motor and tension
Bypass conveyor motor
C-BOX
CBF
Return conveyor tension
Front of machine
Return conveyor motor

- R machine specification


Feed conveyor motor
Bypass/supply conveyor motor and tension
CBF
C-BOX
Return conveyor motor
Front of machine
Return conveyor tension

Sec 1 Adjustment Standard

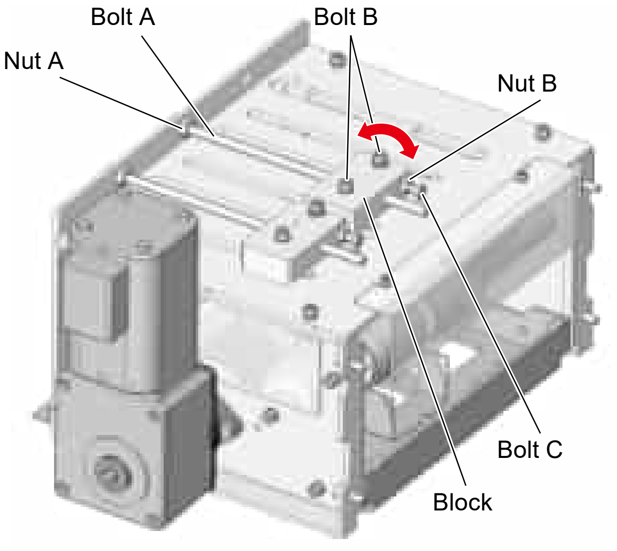
1-1 Conveyor belt

The standard tension for the conveyor belt (feed conveyor and return conveyor) is 0.5%.
Adjust the belt so that it does not slip during machine operation.

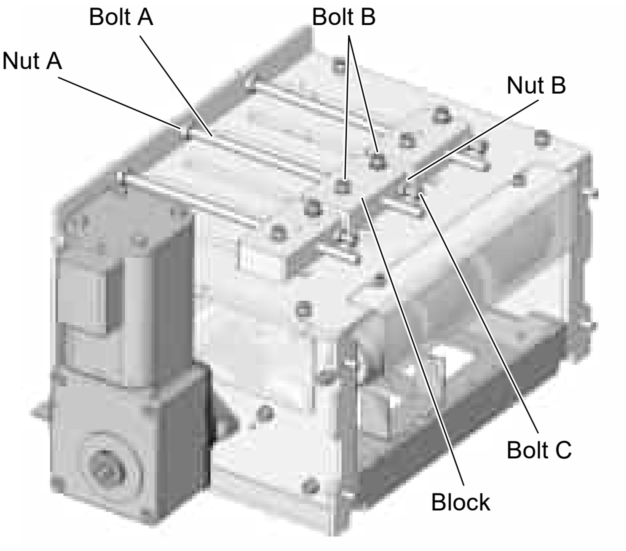
1-2 Feed/Bypass/Supply conveyor tension device

Refer to Chapter 5Fa, Pre for details on the location of the tension device for the feed/bypass/supply conveyor.

- **Cop-Robo x 1**



- **Cop-Robo x 2**



Tension adjustment

Loosen nut A and bolt B, and adjust the tension using bolt A.
Refer to the tension marks on the belt to adjust the tension.

Belt alignment

Loosen nut B, and adjust using bolt C.
When adjusting, the block moves so that you can adjust the alignment.

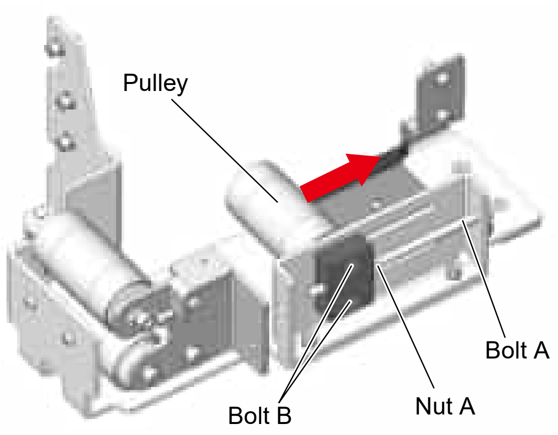
1-3 Return conveyor tension device

Refer to Chapter 5Fa, Pre for details on the location of the tension device for the return conveyor

Tension adjustment

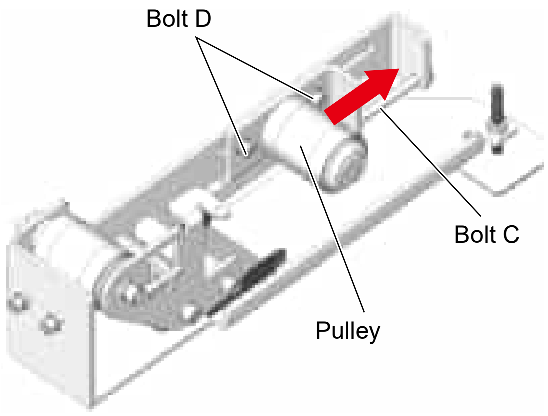
- **For 1 & 2 yarn type**

Slightly loosen bolts B, and loosen nut A.
When adjusting bolt A, the pulley moves so that you can adjust the tension.



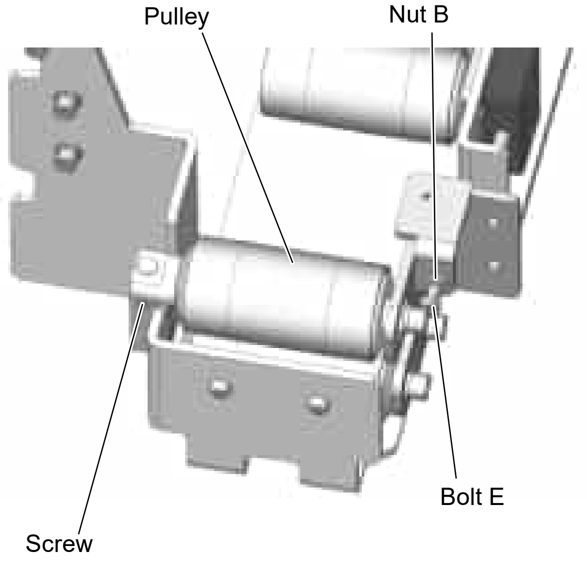
- **For 2 yarn type**

When you adjust bolt C, after bolts D are loosened, the pulley moves so that you can adjust the tension.



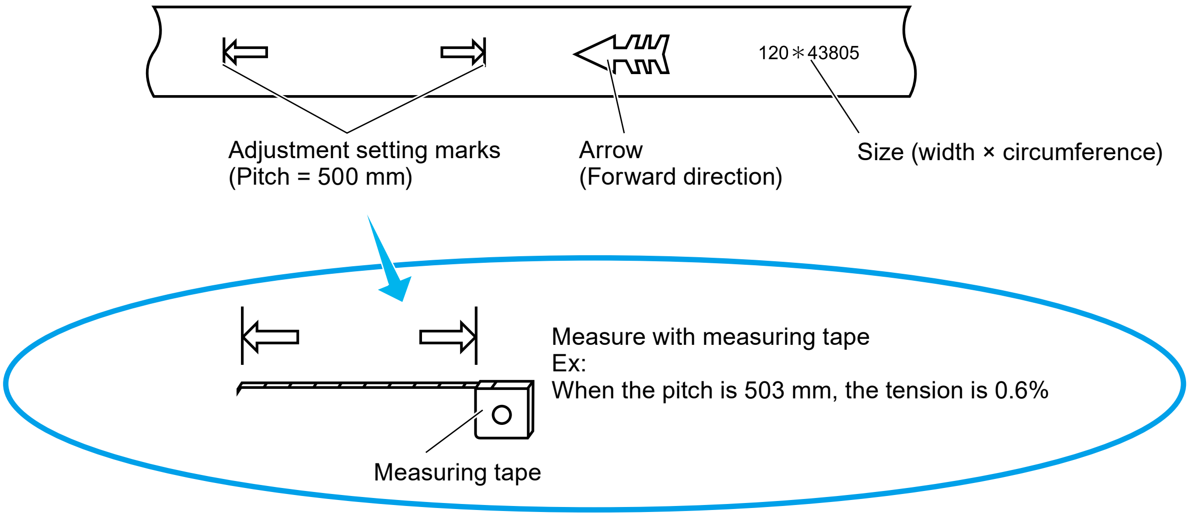
Belt alignment

After the screw and nut B are loosened, when you adjust bolt E, the pulley moves so that you can adjust the alignment.
The procedure is the same for the “1 & 2 yarn type” and for the “2 yarn type.”



Display markings on the belt

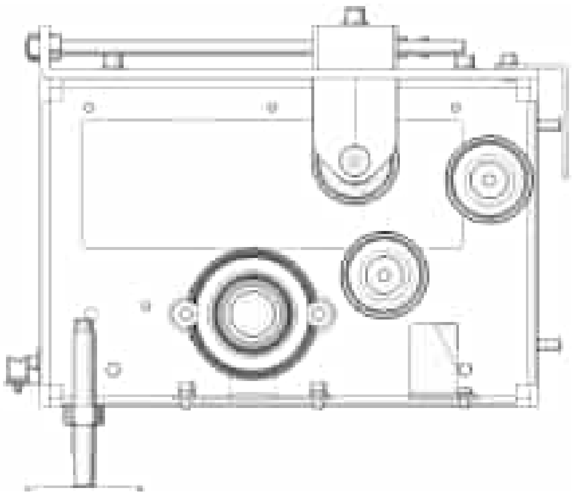
The adjustment setting marks, the forward direction arrow and the size of the belt are displayed on the belt surface.


120＊43805
Adjustment setting marks
(Pitch = 500 mm)
Arrow
(Forward direction)
Size (width × circumference)
Measure with measuring tape
Ex:
When the pitch is 503 mm, the tension is 0.6%
Measuring tape

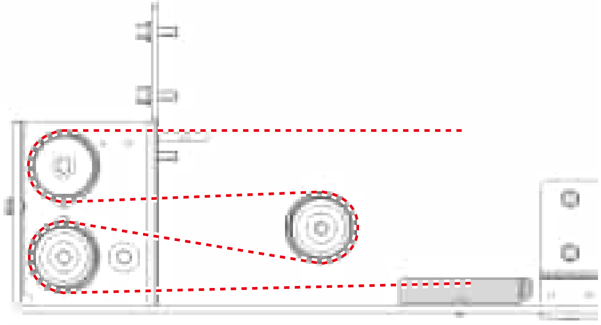
1-4 Conveyor belt

Attach the belt as illustrated below.

- **Feed/bypass/supply conveyor**

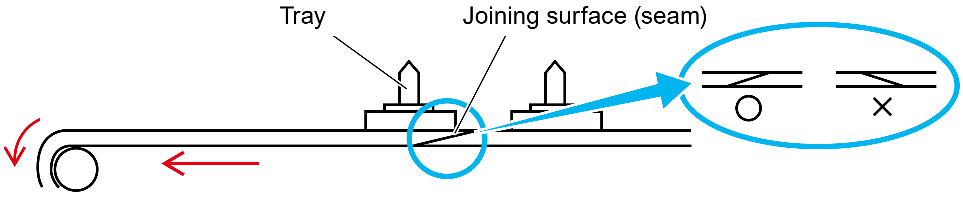


- **Return conveyor**



CAUTION

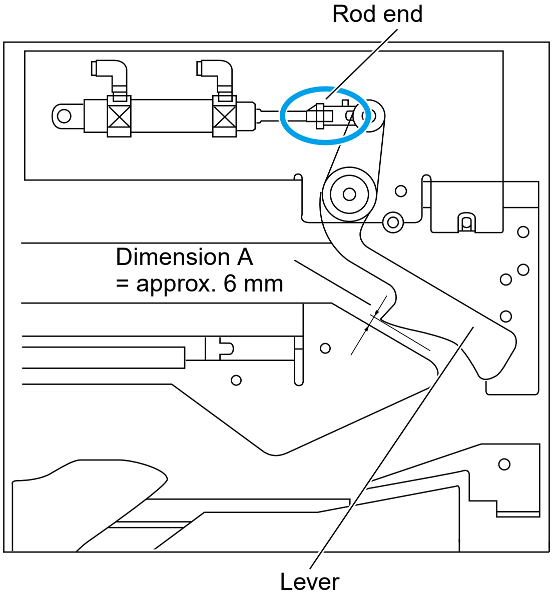
Refer to the forward direction arrow marked on the belt to ensure that the movement or direction is correct.
If the belt is set up backwards, the belt may tear apart. (The joining surface is reversed)


Tray
Joining surface (seam)
○
×

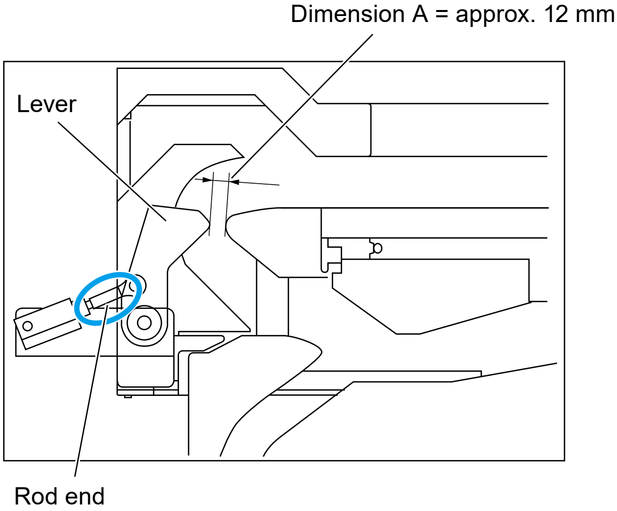
1-5 Tray stopper

The tray stopper function is to prevent the tray from jamming. Refer to Chapter 5Fa, Pre for details on the location of the tray stopper.

- **L machine: Out-end side**


Rod end
Dimension A
= approx. 6 mm
Lever

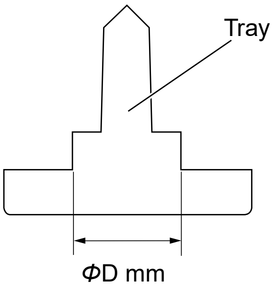
- **R machine: Out-end side**

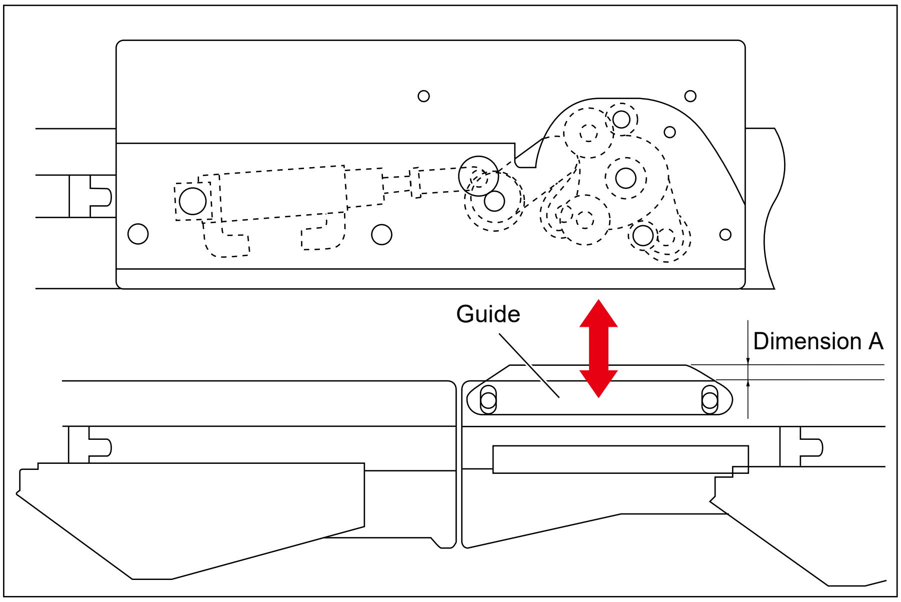

Dimension A = approx. 12 mm
Lever
Rod end

Junction

Adjusting dimension A depends on the size of the tray (ΦD mm) by moving the guide.

ΦD (mm)	Dimension A (mm)
Φ28	7
Φ36	3

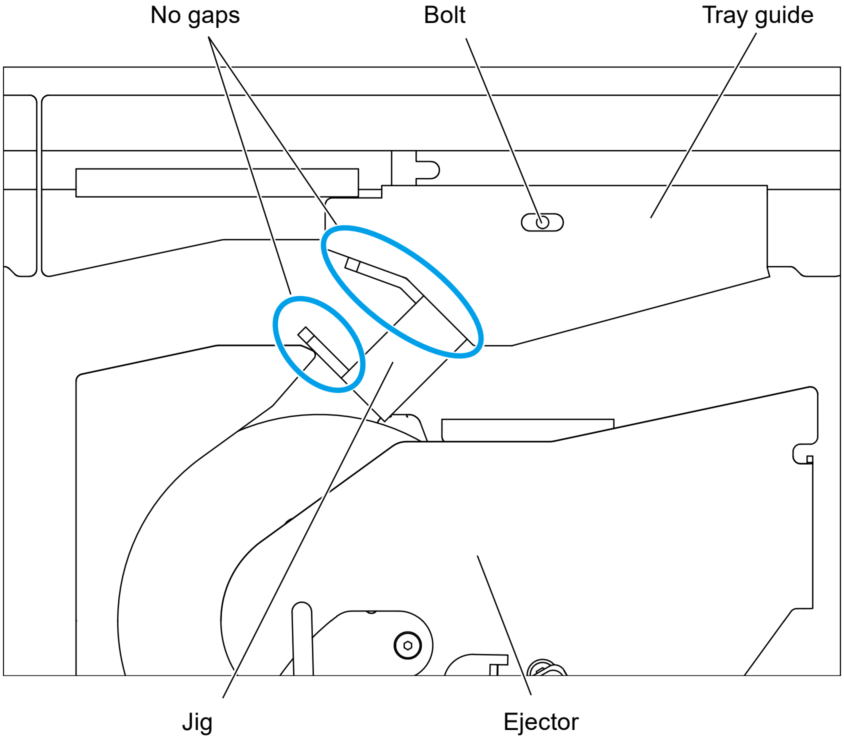



Guide
Dimension A

1-6 Feed conveyor tray guide position

It is necessary to adjust the feed conveyor tray guide position for machines with Link Coner Φ 60 mm specifications and tray selector specifications. Problems such as the tray not being able to pass or falling can be prevented by adjusting the position.

1. **Adjust the ejector position. (Refer to Chapter Pb)**
2. **Slightly loosen the bolt, push the jig against the ejector as shown in the diagram, and push the tray guide against the jig.**
3. **Fix the tray guide with the bolt at a position where there are no gaps between any of the above.**



1-7 VOS settings

The VOS settings are listed below. Change the setting conditions when necessary.

S-Feed	Sets the control method for the feed C/V tray stopper
Feed C/V tray supply speed	Sets the tray supply speed when S-Feed is OFF
Feed C/V separate control	Sets the feed C/V tray flow method
Tray level control	Sets the number of trays which can be in circulation to enable a cop change
Return C/V reverse cycle	Sets the return C/V reverse cycle

Sec 2 Maintenance

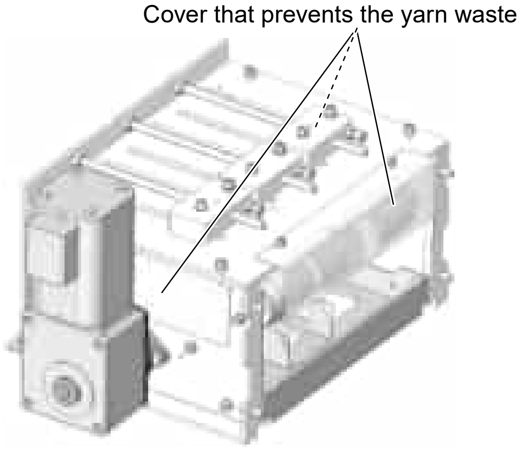
Any yarn waste or cotton fly that builds up leads to motor damage and belt cracking.

Frequency	Item	Guideline
As necessary	Conveyor brush	Clean conveyor brush
	Between frame spans	Using an air gun, clean the cotton fly caught on the joints between the frames
Weekly	Pulley	Clean the yarn waste around the pulley

2-1 Pulley

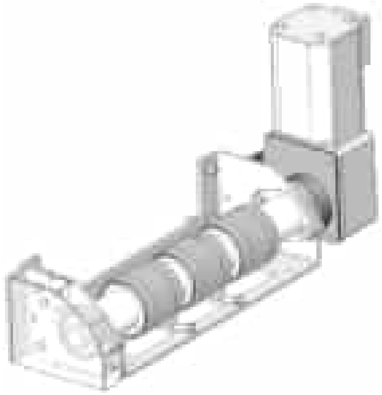
- **Pulley on feed/bypass/supply conveyor (drive-end side)**

Remove the covers (located in 3 places) that prevent the yarn waste from getting caught in the pulley and clean the yarn waste around the pulley.



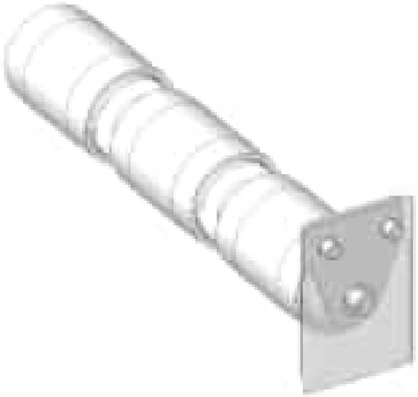
- **Pulley on feed/bypass conveyor (out-end side)**

Remove the CBF guide, and clean the yarn waste around the pulley.



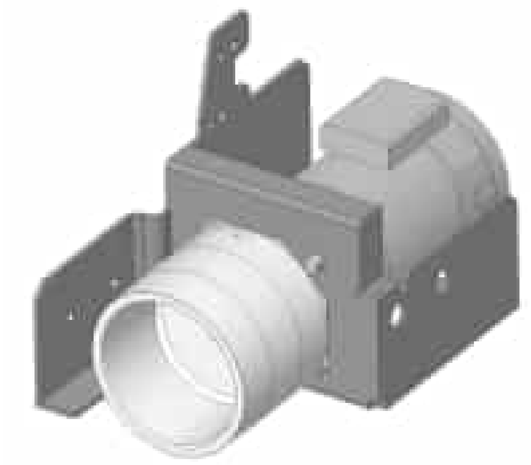
- **Pulley under feed conveyor frame**

Clean the yarn waste stuck in between the pulleys (two sections).



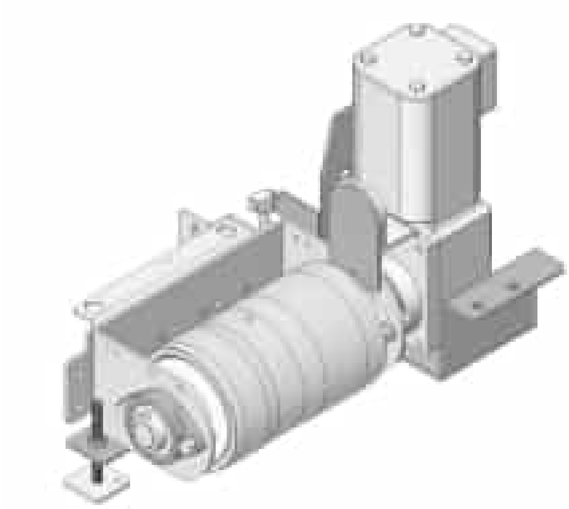
- **Return conveyor**
  Pulley section (out-end side) (1 yarn type specification)

Remove the CBF cover and clean yarn waste around the pulley.

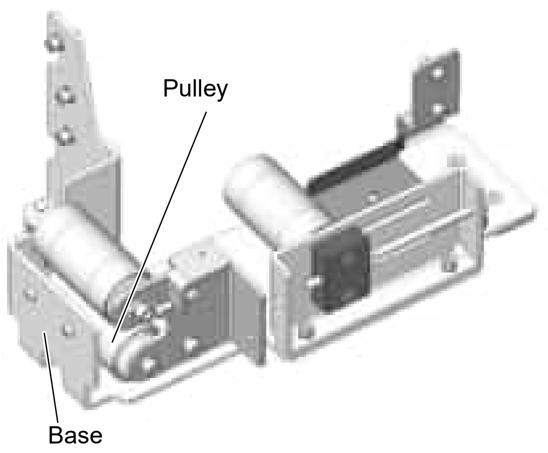


- **Return conveyor**
  Pulley section (out-end side) (2 yarn type specification)

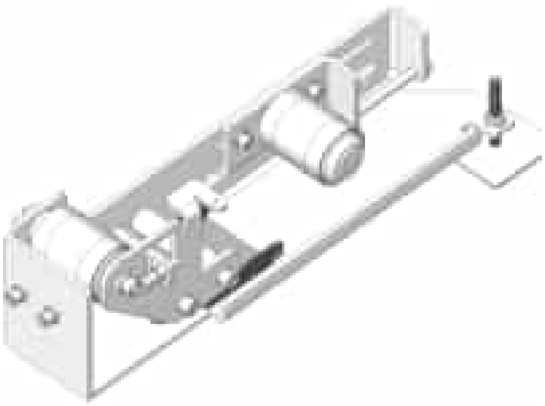
Remove the CBF cover and clean yarn waste around the pulley.



- **Return conveyor tension (1 & 2 yarn type)**



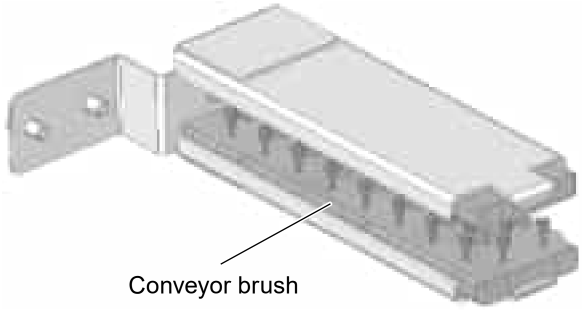
- **Return conveyor tension (for 2 yarn type)**



Remove the return conveyor guide on the front, and clean the yarn waste around the pulleys.
Check whether there are any obstructions stuck between the pulley and the base on the return conveyor tension section for the 1 & 2 yarn type.
Any obstructions may cause the belt to crack or slip during operation.

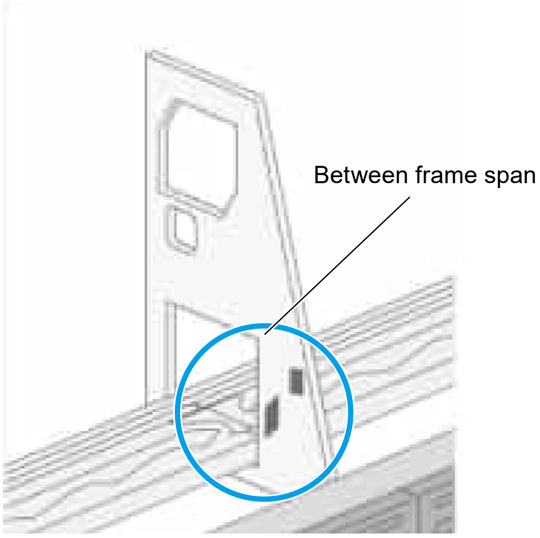
2-2 Conveyor brush

Clean the two conveyor brushes on the feed conveyor (1 location) and on the return conveyor (1 location).



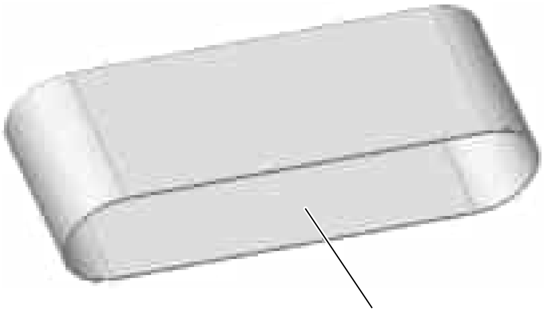
2-3 Between frame span

When cotton fly builds up in between the conveyor frame and the belt, and on the joints between the frames, remove it with an air gun or other tool.

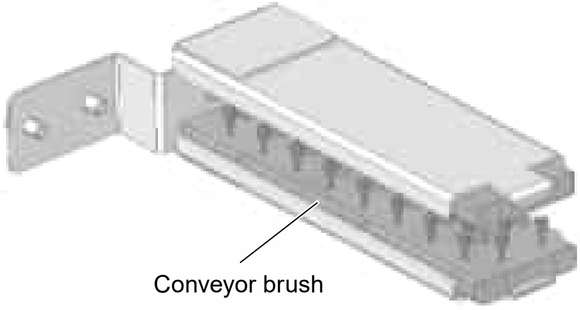


Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.



Conveyor belt



Conveyor brush

Electrical Parts

6
Chapter

Contents

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  1-1 Winding unit alarms
  1-2 Main machine alarm
2 **Winding Unit** 7
  2-1 Layout of electrical equipment
  2-2 Board layout
  2-3 Status Display
3 **Main Machine**..12
  3-1 Layout of Electrical Equipment
  3-2 Principal functions for main machine
4 **Maintenance** 17
5 **Consumables**...19

Sec 1 Troubleshooting

1-1 Winding unit alarms

Alarm recovery method

- **Package alarms**

Alarm LED	Upper level light on
Status display	P*

* After checking the conditions of the end of the yarn on a package, press the illuminated reset switch (upper level).

- **Bobbin alarms**

Alarm LED	Lower level light on
Status display	b*

* After checking the conditions of the bobbins, press the illuminated reset switch (lower level).

- **Other alarms**

Alarm LED	Mid-level light on
Status display	Other than the above

* If the alarm continues to sound, clear it by following the clearing procedure from the VOS screen.

Alarm type & description

Status display	Alarm type	Cause
01	Compiling error	Program fault
02	Calculation error	Program fault
03	Calculation error (latch)	Program fault
04	Sequence arithmetic stop error	Program fault
05	Carrying error	Program fault
08	Backup error	Data initialization
09	Program compatibility error	System program and sequence program compatibility error
11	DISPLAY PCB alarm	DISPLAY PCB error
12	SPLICER PCB alarm	SPLICER PCB error
13	MIDDLE PCB alarm	MIDDLE PCB error
14	BALCON PCB alarm	BALCON PCB error
15	M/G CAN PCB alarm	M/G CAN PCB error
60	DRUM BLD: Communication timeout between SPC	Communication error with UNIT-SPC
61	DRUM BLD: CPU error	CPU error
62	DRUM BLD: Low voltage (Momentary outage)	Low voltage
63	DRUM BLD: High voltage	High voltage
64	DRUM BLD: Drum sensor error	Drum sensor input error

Status display	Alarm type	Cause
65	DRUM BLD: CS sensor error	CS sensor input error
66	DRUM BLD: Speed deviation	Speed deviation
67	DRUM BLD: Motor overheat protection (thermistor)	Motor temperature high
68	DRUM BLD: Overload (thermal)	Overload occurred
69	DRUM BLD: High voltage	Overcurrent generated
6A	DRUM BLD: IPM fault	IPM fault
6b	DRUM BLD: CS sensor input error	CS sensor input error
6C	DRUM BLD: CS Sensor reverse rotation error	Drum rotated in reverse
6d	DRUM BLD: IPM temperature error	High IPM temperature, abnormal value
6E	DRUM-BLD: Ground fault	Ground fault protection
6F	DRUM BLD:Ready OFF	Ready signal OFF
90	Air heater overheat alarm	Overheating error on air heater
91	Air heater disconnect alarm	Air heater is disconnected
92	Air heater temperature fluctuation alarm	Air temperature is fluctuating excessively from the set temperature
93	Temperature sensor disconnect alarm	Sensor that monitors the heater temperature is damaged or disconnected
94	Temperature control PCB communication alarm	Communication error between UNIT SPC and HOT SPLICER controller
95	CPU error on temperature control PCB	CPU error occurred on temperature control PCB
A1	Yarn threading error (system)	Yarn threading error Yarn break occurred right after drum start
A2	Yarn threading error (AD)	AD error
A3	Take-up tube supply error	Take-up tube not ready
A4	Rear package not processed	Doffing operation not possible due to package at rear
A5	AD unit No. recognition error	Infrared communication failure between the unit and AD
b0	Bobbin supply error	No bobbin supplied
b1	Lower yarn pickup error	Lower yarn pickup error
b2	---	---
b3	Start up cut alarm	Clearer cut occurs frequently
b4	---	---
b5	Yarn count alarm (UQC) Yarn Count alarm (iQON) Yarn count alarm (YM) Yarn count alarm (KC)	---
b6	Pearl chain alarm (UQC) Pearl Chain alarm (iQON) CLUSTER alarm (YM) IPM alarm (KC)	---
b7	Moire alarm (UQC) Moire alarm (iQON)	---
b8	CV alarm (UQC) CV alarm (iQON) CV alarm (KC)	---
b9	Foreign fiber alarm (UQC) Foreign fiber alarm (iQON) Foreign fiber alarm (YM) DM alarm (KC)	---

Status display	Alarm type	Cause
bA	Hairiness alarm (UQC) Hairiness alarm (iQON) SFI alarm (YM)	---
bb	IPI alarm (UQC) IPI alarm (iQON)	---
bC	CMT alarm (UQC) CMT alarm (iQON)	---
bd	YF alarm (UQC) YF alarm (iQON)	---
bE	MF alarm (UQC) MF alarm (iQON) FF CLUSTERalarm (YM)	---
bF	Other alarms	---
bG	PP alarm (UQC) PP alarm (iQON) Palarm (YM)	---
C0	Clearer zero adjustment alarm	Clearer zero adjusting error
C1	Clearer slot jammed alarm	Yarn waste clog in clearer slot
C2	Insufficient cut alarm	Clearer did not cut sufficiently
C3	Clearer technical alarm	Clearer technical alarm occurred * Refer to clearer alarm screen.
C4	Clearer initial state alarm	The clearer did not finish initializing
d1	Drum lapping alarm	Drum lapping occurred
d2	Traverse Error	Traverse error detected
d3	Traverse error (2 W <-> 2.5 W)	Traverse solenoid
E1	Splicer home position sensor alarm	Splicer operation error Splicer home position sensor alarm
E2	Splicer yarn guide lever home position sensor alarm	Splicer yarn guide lever operation error Splicer yarn guide lever home position sensor error
E3	Bal-Con sensor alarm Bobbin sensor alarm Package diameter detection sensor alarm	Bobbin (package) detection sensor error
E4	---	---
E5	PC sensor alarm	Insufficient drum rotation during reverse operation
E6	Package rotating sensor alarm	Package rotating sensor error
E7	Retie pipe home position sensor alarm	Retie pipe operation error Retie pipe home position sensor error
E8	PLC21 alarm	PLC21 yarn travel detection error * Dirty receiver and transmitter windows, etc.
E9	Lower yarn sensor alarm	Lower yarn sensor error * Dirty receiver and transmitter windows, etc.
EA	PC sensor alarm	PC sensor error Tension error detected
Eb	Upper yarn sensor alarm	Upper yarn sensor malfunction
EC	Drum lapping detection sensor alarm	Drum lapping or winding detection sensor error
Ed	Traverse sensor alarm	Traverse sensor error
EE	Waste yarn detection sensor alarm	Waste yarn detection sensor error
EF	Tensor operation check sensor alarm	Tensor opener operation error Tensor operation check sensor error
EG	Suction mouth angle sensor alarm	Shutter mouth operation error Suction mouth angle sensor error

Status display	Alarm type	Cause
EH	Shutter home position sensor alarm	Shutter operation error Shutter home position sensor error
EJ	Bal-Con home position sensor alarm	Bal-Con operation error Bal-Con home position sensor error
EL	Peg home position sensor alarm Tray eject home position sensor alarm	Peg operation error Peg home position sensor error Tray eject operation error Tray eject home position sensor error
En	Magazine can position sensor alarm	Magazine can operation error Magazine can home position sensor error
Eo	Yarn guide lever home position sensor alarm	Yarn guide lever operation error Yarn guide lever home position sensor error
EP	Yarn pickup lever home position sensor alarm	Yarn pickup lever operation error Yarn pickup lever home position sensor error
Er	Upper yarn sensor detection error alarm	Upper yarn sensor detection error occurred
H1	Suction shutter cotton fly clog	Cotton fly is clogged in suction shutter
n1	Bal-Con down alarm	Bobbin detection sensor is left ON after drum start
n2	Bal-Con Up alarm	Bal-Con up error
o1	Unconsumed wax alarm	Wax application failure
o2	No wax alarm	No wax
P0	No package alarm	No package equipped on cradle
P1	Upper Yarn End Find Error	---
P2	Upper double yarn alarm	Double yarn detected during upper yarn end find operation
P3	Sizing alarm	Package diameter exceeds the specified value
P4	Package Brake Error	Package does not stop within specified time
P5	PJC alarm (upper limit)	Too many yarn breaks/packages
P6	PJC alarm (lower limit)	Too few yarn breaks/packages
P7	Package half-locked alarm	Bad package rotation occurred
P8	Vibration alarm	High vibration during winding
r0	R/W module communication alarm	Communication error between UNIT SPC and R/W module
r1	Tag communication alarm	R/W module can’t communicate with tag on tray
S1	Mis-splicing	---
S2	Splicer Cut	---
S3	Air Heater Temperature	Change Air heater is out of range for set temperature
Γ1	Tension break alarm	Frequent breaks in tension
Γ3	Tension error (LOW)	Tension error (LOW) detected * Tensor is off, etc
Γ4	Tension error (HIGH)	Tension error (HIGH) detected
Γ5	Winding tension is error (H)	The tension during winding is higher than other units
Γ6	Winding tension is error (L)	The tension during winding is lower than other units
Γ7	Tensor level error (H)	The applied tension level during winding is higher than other units
Γ8	Tensor level error (L)	The applied tension level during winding is lower than other units
u1	DC5V Power Supply Error	Line voltage error detected on DC5V power supply
u2	DC15V Power Supply Error	Line voltage error detected on DC15V power supply
u3	DC24V Power Supply Error	Line voltage error detected on DC24V power supply

1-2 Main machine alarm

Main machine Fixer call

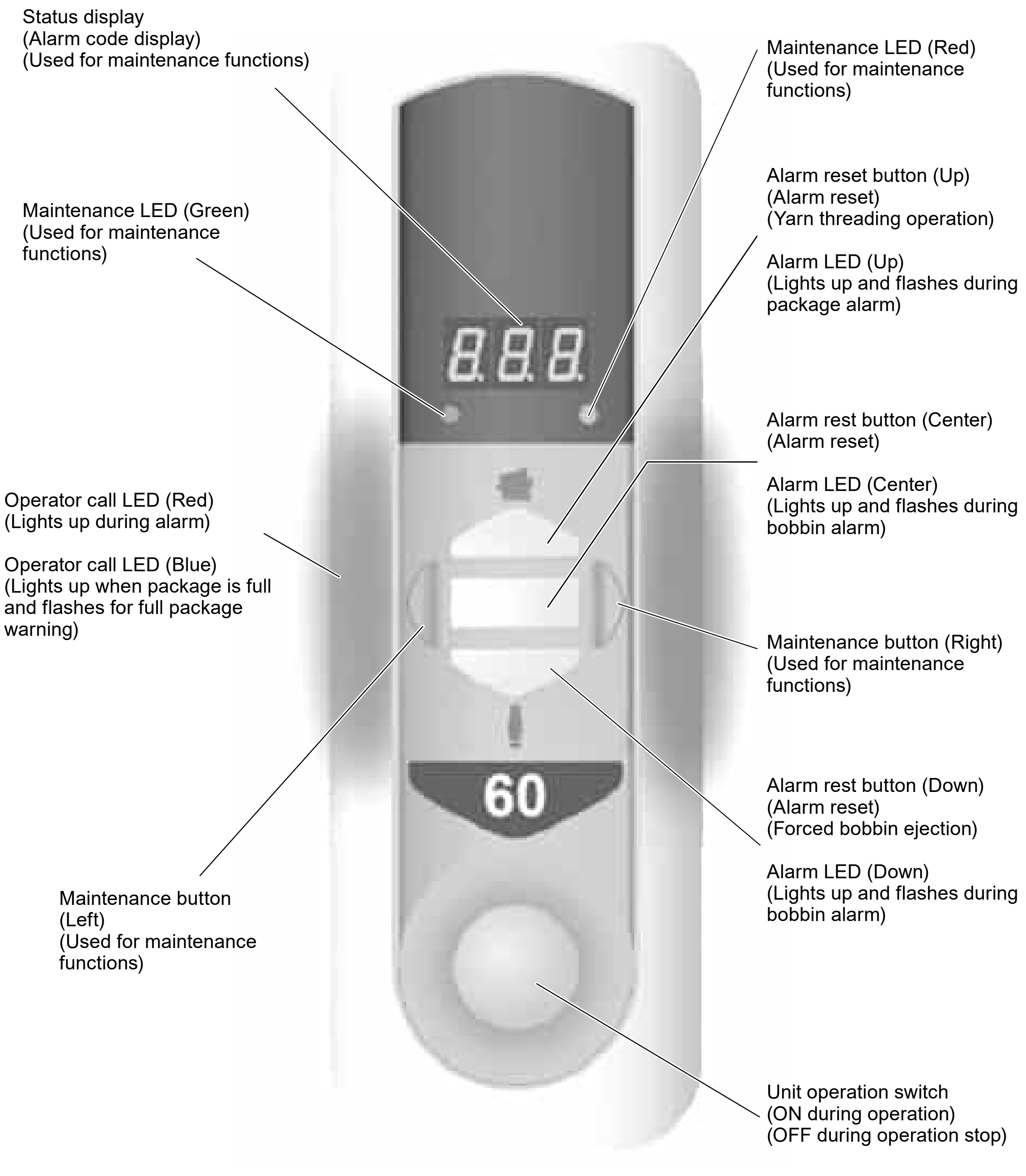
Classification	Alarm type	Signal tower		Rotation signal warning		Machine Status	Cause
		Red	Yellow	Red	Yellow		
Machine	Emergency Stop	Flashing		Lit		Machine operation stopped	Emergency stop switch pressed
	Emergency stop switch (Wire switch)						Wire switch is pulled
	Communication Error	Flashing (High speed)				Machine operation continued	Communication error occurred between devices inside machine
	Momentary Outage, or Blower Outage	Flashing				Machine operation stopped	Momentary outage or power outage occurred
	Air down						Main air pressure low
	Lower static pressure/static pressure error						• Yarn wasted accumulation inside blower box • Static pressure gauge disconnection • Air pipe missing
	Static pressure fluctuation error					Continued machine operation (Alarm displayed only on VOS)	Yarn wasted accumulation inside blower box
Main control box	DC24V input power alarm	Flashing				Machine operation stopped	Input fuse break (Main fiber SPC, expanded PCB or interface PCB)
	DC24V output power alarm						Output fuse break (Main fiber SPC, expanded PCB or interface PCB)
	Stop button contact error						Stop button contact error
	Blower inverter alarm						Blower inverter alarm occurred
	Conveyor, Blow Cleaner Trip						Motor breaker trip on conveyor or blow cleaner
	Return conveyor inverter alarm						Return conveyor inverter alarm occurred
	Return conveyor inverter communication error						• Inverter failure • Cable disconnection
	Dust Collector Thermal Trip						Motor breaker trip on dust collector
	Control panel overheat alarm					Machine operation continued	High temperature inside control box, exceeds constant temperature level
	Cooling fan alarm						Cooling fan overheating
	Power meter power supply voltage error					Continued machine operation (Alarm displayed only on VOS)	• Power supply voltage fluctuation • Power meter failure • Cable disconnection
	Power meter communication error						• Power meter failure • Cable disconnection
	Air flowmeter error						• Air flowmeter failure • Cable disconnection
Blow cleaner	Blow cleaner travel error alarm	Flashing				Blow cleaner operation stopped	Blow cleaner travel error
Bobbin conveyor	Empty conveyor clog detection	Flashing				Bobbin conveyor operation stopped	Empty conveyor clog occurred

Classification	Alarm Type	Signal tower		Rotation signal warning		Machine Status	Cause
		Red	Yellow	Red	Yellow		
Water splicer	Water Tank Level alarm	Flashing				Unit yarn splicing stop	Empty water tank
	Water tank pressure down alarm						Low water tank pressure
	Water pipe residual air alarm						Air bubbles present inside water pipe
AC/DC Converter	Converter error	Flashing				Stopping operation	Converter error
	Converter communication error					Operation continued	Converter communication error
	Converter CPU error					Stopping operation	Converter CPU error
	Converter output short error						Converter output short error
	Converter DB circuit error						Error occurred on regenerative circuit for converter
	Converter FET Damage						FET element damage inside converter
	Converter DB resistor overheat error						Overheating error occurred on regenerative resistor for converter
	Converter DB resistor protection						Protective function on regenerative resistor for converter enabled
	Converter DB resistor break detection						Break detected on regenerative resistor for converter
	Converter Output Voltage Error						Converter output voltage error
Span slave	Span slave output short error	Flashing				Machine operation stopped	Span slave output short error
	Span slave communication error					Operation continued	Span slave communication error
Package conveyor	Package conveyor alarm		Flashing (High speed)			Operation continued	Package left unattended for extended period of time on package conveyor
	Package conveyor inverter alarm	Flashing				Package conveyor operation stop	Package conveyor inverter alarm occurred
	Package conveyor inverter communication error						• Inverter failure • Cable disconnection

Sec 2 Winding Unit

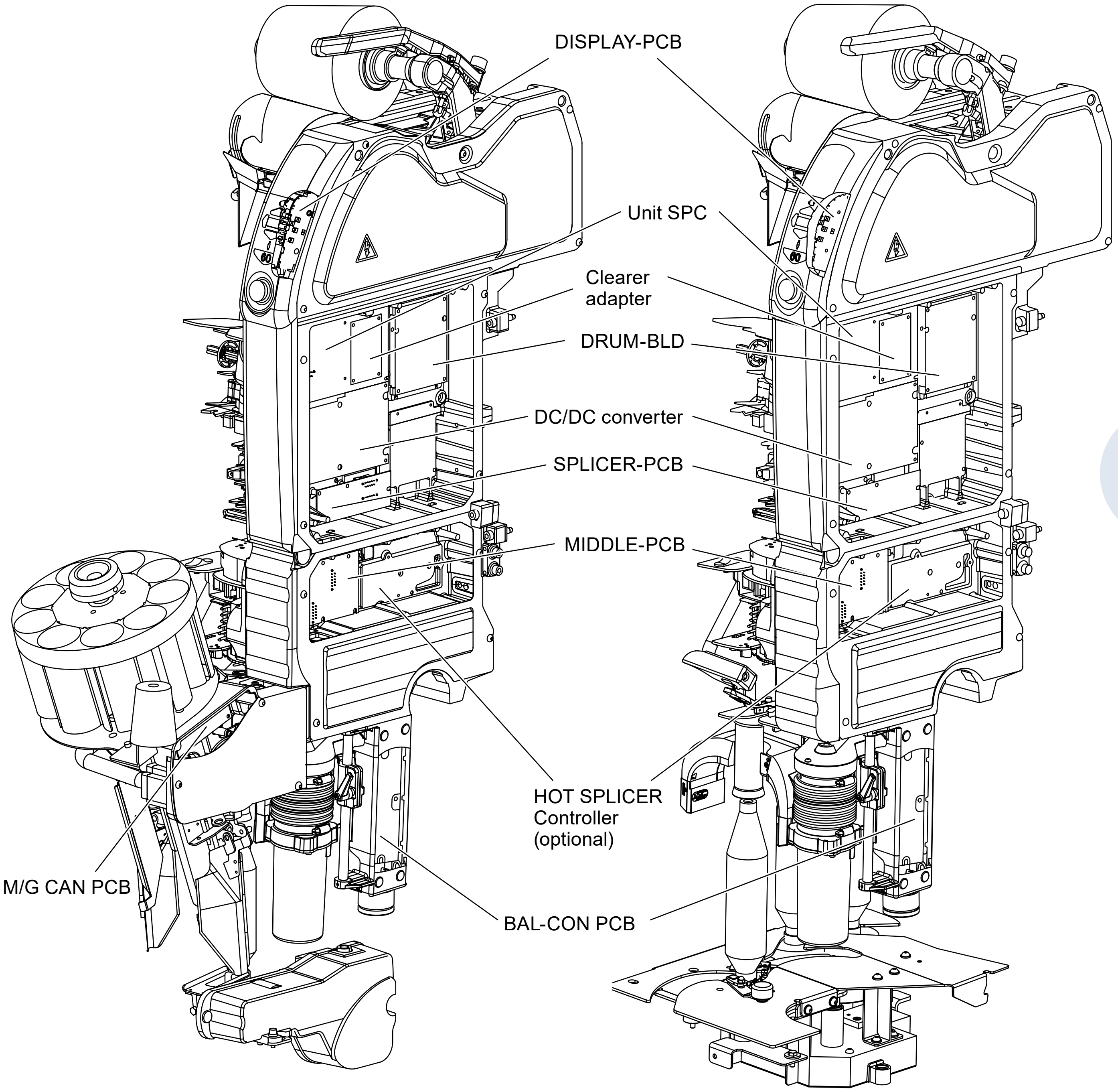
2-1 Layout of electrical equipment

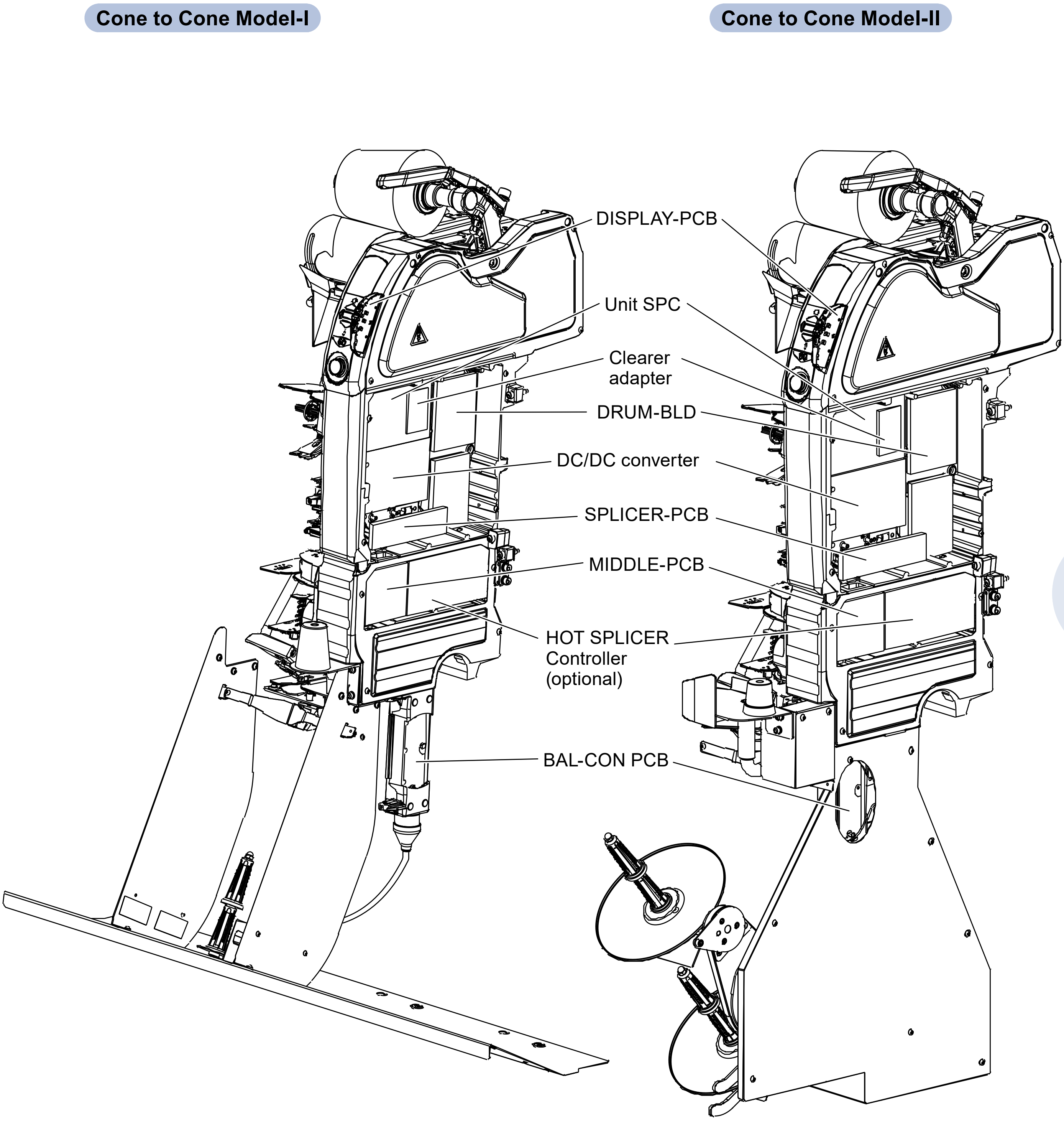
Operation & display parts


Status display
(Alarm code display)
(Used for maintenance functions)
Maintenance LED (Green)
(Used for maintenance
functions)
Operator call LED (Red)
(Lights up during alarm)
Operator call LED (Blue)
(Lights up when package is full
and flashes for full package
warning)
Maintenance button
(Left)
(Used for maintenance
functions)
Maintenance LED (Red)
(Used for maintenance
functions)
Alarm reset button (Up)
(Alarm reset)
(Yarn threading operation)
Alarm LED (Up)
(Lights up and flashes during
package alarm)
Alarm rest button (Center)
(Alarm reset)
Alarm LED (Center)
(Lights up and flashes during
bobbin alarm)
Maintenance button (Right)
(Used for maintenance
functions)
Alarm rest button (Down)
(Alarm reset)
(Forced bobbin ejection)
Alarm LED (Down)
(Lights up and flashes during
bobbin alarm)
Unit operation switch
(ON during operation)
(OFF during operation stop)
8.8.8.
60

2-2 Board layout

Straight Magazine **Bobbin Tray (Link Coner)**


DISPLAY-PCB
Unit SPC
Clearer adapter
DRUM-BLD
DC/DC converter
SPLICER-PCB
MIDDLE-PCB
HOT SPLICER Controller (optional)
M/G CAN PCB
BAL-CON PCB

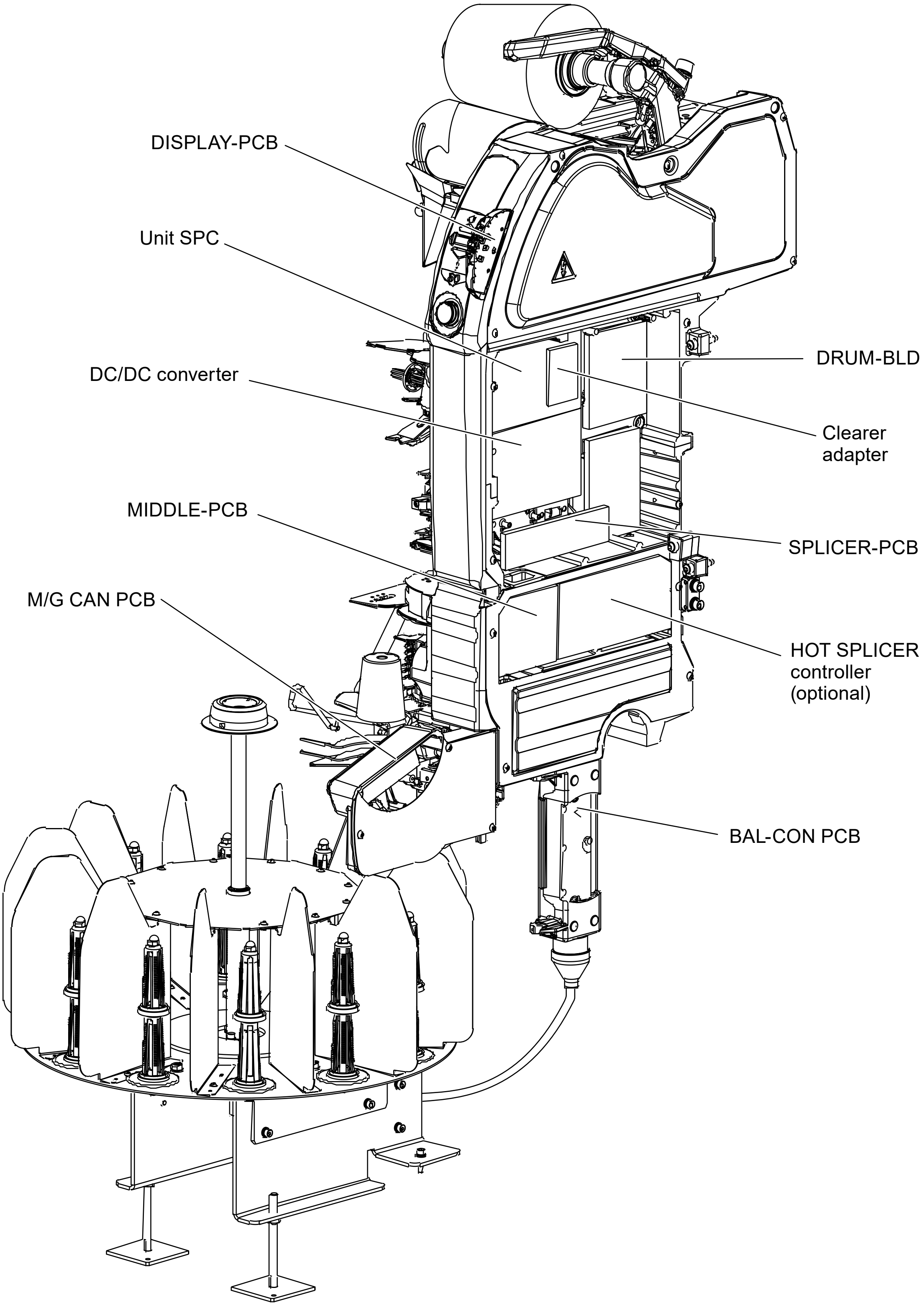


Cone to Cone Model-I

Cone to Cone Model-II

DISPLAY-PCB
Unit SPC
Clearer adapter
DRUM-BLD
DC/DC converter
SPLICER-PCB
MIDDLE-PCB
HOT SPLICER Controller (optional)
BAL-CON PCB

Rewind Magazine


DISPLAY-PCB
Unit SPC
DC/DC converter
MIDDLE-PCB
M/G CAN PCB
DRUM-BLD
Clearer adapter
SPLICER-PCB
HOT SPLICER controller (optional)
BAL-CON PCB

2-3 Status Display

- **Status display**

Spindle No. display	Machine stopped
"– – –” Lit	Omit spindle
"– – –” Flashing	Yarn splicing stop signal received
"– – –” Progress display	Cancelling yarn splicing stop

- **Alarm display**

Displays the alarm code when an alarm occurs.
(Refer to Chapter 6, 1-1 in instruction manual or VOS screen ID <B0000>)

- **Other displays**

Displays data for each check mode when using the unit check mode.
(Refer to the VOS Screen ID <41110> for unit check mode settings)

* Display priority

The priority hierarchy of items shown on the unit status display is given below.

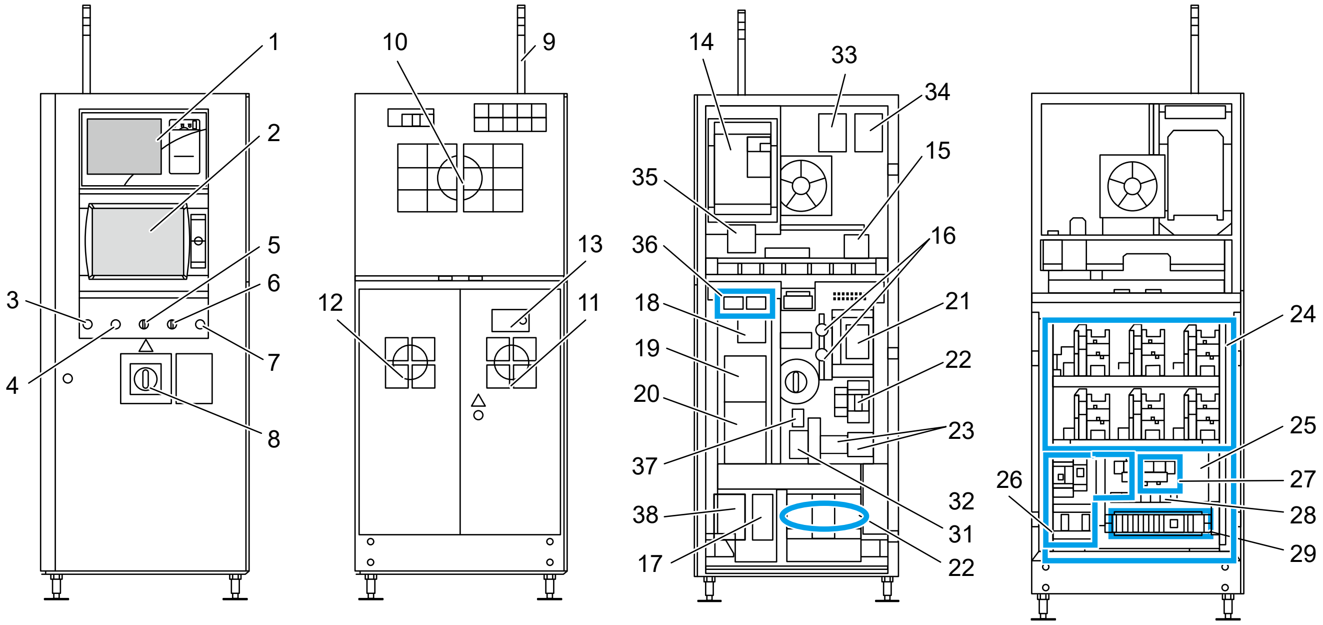
Display priority (high)
- Omit spindle
- Alarm
- Check mode
- Spindle No. or splicing stop

Display priority (low)

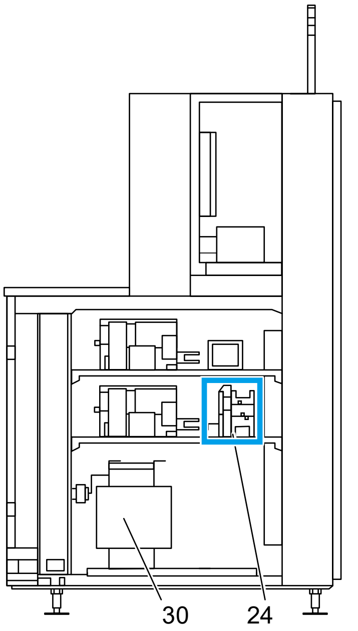
Sec 3 Main Machine

3-1 Layout of Electrical Equipment

Main Control Box

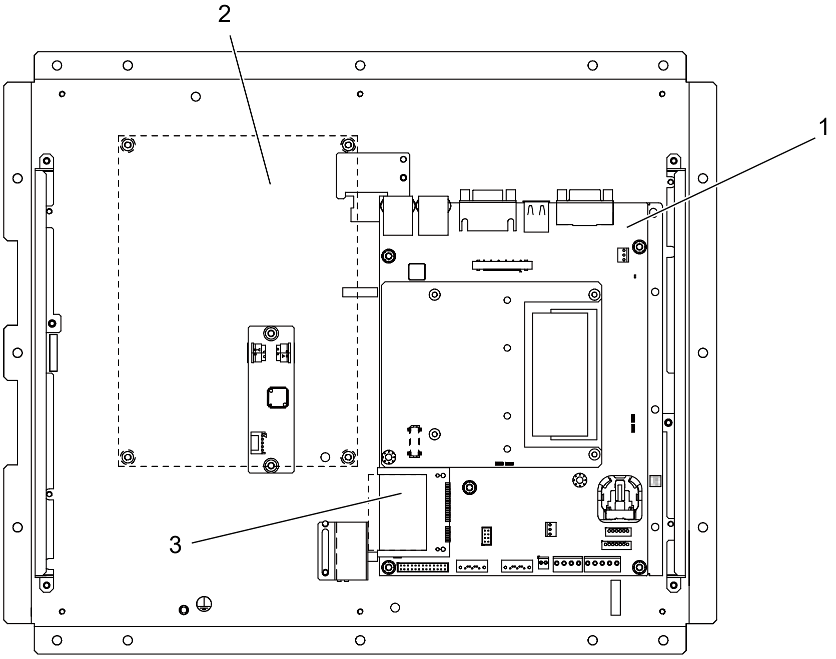


(1) Clearer control box
(2) VOS III
(3) Stop button
(4) Start button
(5) Bobbin/Tray conveyor switch
(6) Blow cleaner switch
(7) Clean mode button
(8) Main switch
(9) Signal tower
(10) Cooling fan (Top)
(11) Cooling fan (Bottom-right)
(12) Cooling fan (Bottom-left)
(13) Package conveyor start button
(14) Blower inverter
(15) DC reactor
(16) Noise filter
(17) DC control power supply
(18) Gateway PCB
(19) PCB for main fiber SPC
(20) Expanded PCB for main fiber SPC
(21) PCB for power distribution
(22) Circuit breaker
(23) Magnet contactor
(24) AC/DC converter
(25) Interface PCB
(26) Circuit breaker
(27) Motor breaker
(28) Magnet contactor
(29) Connectors for machine wiring connections
(30) T1 trance
(31) PCB for power outage detection
(32) Soft starter
(33) Package conveyor inverter
(34) Return conveyor inverter
(35) Power meter
(36) Communication distribution board
(37) Current sensor
(38) DC control power supply (for VOS, MCU)



(80 winding unit machine only)

VOS III



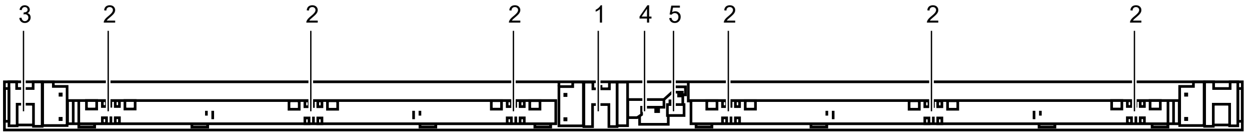
[Rear view]

(1) VOS CPU board

(2) MCU (Machine Control Unit) board

(3) C-FAST

Unit duct



(Length of 1 span)

(1) Span slave print circuit board

(2) PCB for branching communications

(3) Repeter print circuit board

(4) Power supply branch connectors (winding unit)

(5) Power supply branch connectors (dust collector [option])

3-2 Principal functions for main machine

Machine operation & stop controls

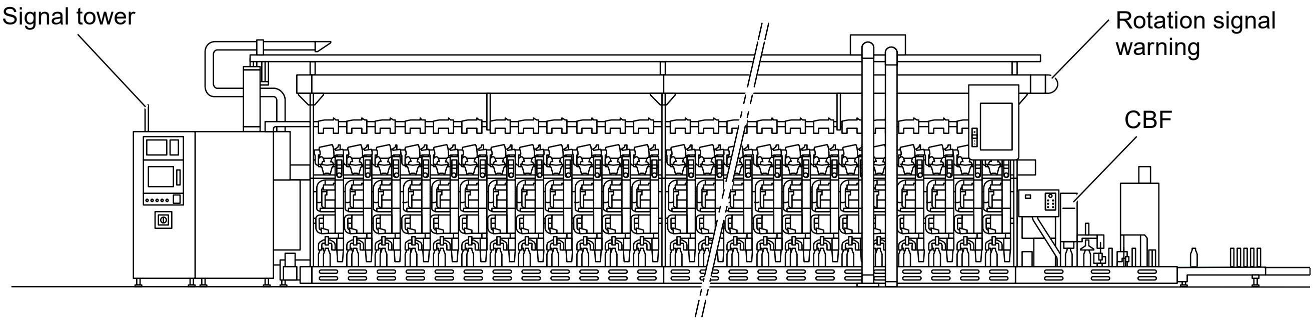
They control the overall start and stop operations for the machine.

Machine Alarm Detection & Support Method Display

The alarm is detected, the machine and devices are stopped, and the alarm location is displayed.
When an alarm occurs, the tower signal and rotation signal warning notify the surrounding personnel, and a picture of the problem location and the support method are displayed.

Machine operation status display

The signal tower on the main control box and the out-end rotation warning signal notify surrounding personnel about the machine operation status.



[The signal tower on top of the main control box]
This tower notifies the surrounding personnel about the general alarms for the machine.

	Lit	Flashing	
		At 0.2 second intervals	At 2 second intervals
Red	AD error	Communication error	Fixer call*
Yellow	---	Operator call*	---
Green	Operating	---	Stop during operation due to clean mode (Cycle stop)

* Refer to Chapter 6, 1-2.

[Out-end Rotation Warning Signal of the Winding Unit (Link Coner, Bobbin Tray)]
This rotation warning signal notifies the surrounding personnel about the alarms related to the CBF.*

	Lit	Flashing	
		At 1 second intervals	At 2 second intervals
Red	• CBF error • Steam setter problem	• Bypass line 1 full • Bypass line 2 full	• Emergency stop • Spinning frame problem
Yellow	• Bypass line 1 operator call • Bypass line 2 operator call • Bypass line 1 full • Bypass line 2 full • Parts feeder bobbin empty • Parts feeder hoist at upper end	---	---

* Refer to the Chapter 7 (VOS) for further details on the alarms.

Blower control

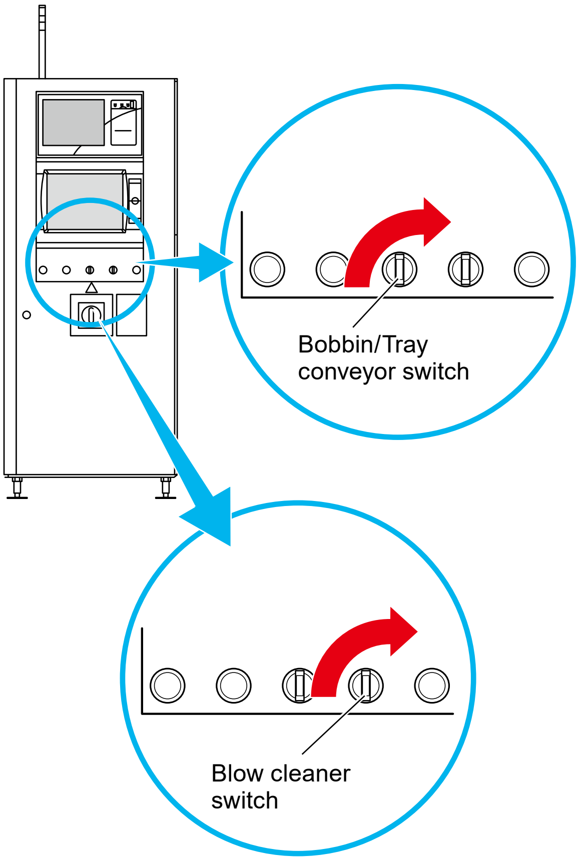
Blower motor is run based on VOS settings.

* For details, refer to Chapter 5Ba.

Tray conveyor & bobbin conveyor control

This control drives either the bobbin conveyor (Magazine) or the tray conveyor (Bobbin Tray) using the bobbin / tray conveyor switch on the switch panel located in the main control box.

* There is also a drive switch on the out-end side for the bobbin conveyor.



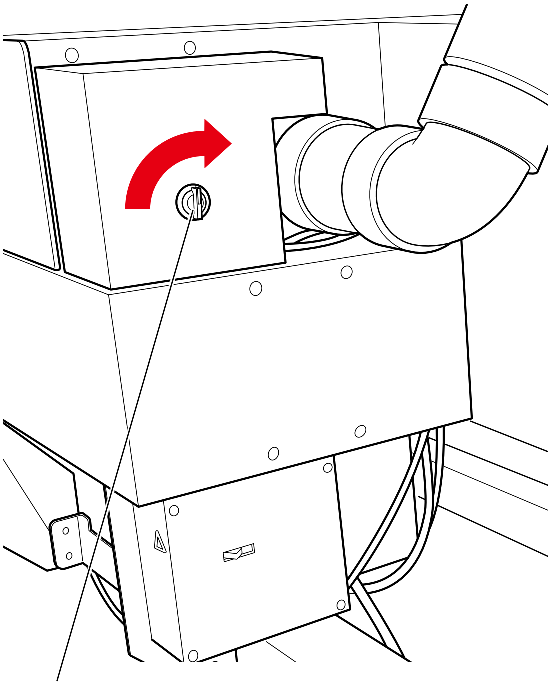
Blow cleaner control

The drive for our in-house made blow cleaner is controlled using the blow cleaner switch on the switch panel located in the main control box.
Intermittent operation is also possible.

* Intermittent operation is standard on equipment with 36 winding units or less, and optional on equipment with 38 winding units or more.

Dust collector control

There is a dust collector system for each span.
It is controlled using the dust collector operation switch for Span No.1.



Package shutter control

The product type is set using the package conveyor product setting knob. Pressing the start button opens the corresponding shutter for the product type.

* The product type for each span is set on the VOS.

Package conveyor control

The package conveyor is controlled using the package conveyor operation switch located on the back side of the main control box. The LED for the switch lights up during drive cycle operation.

* When equipped with a package shutter, the package conveyor is driven after the package shutter operation.

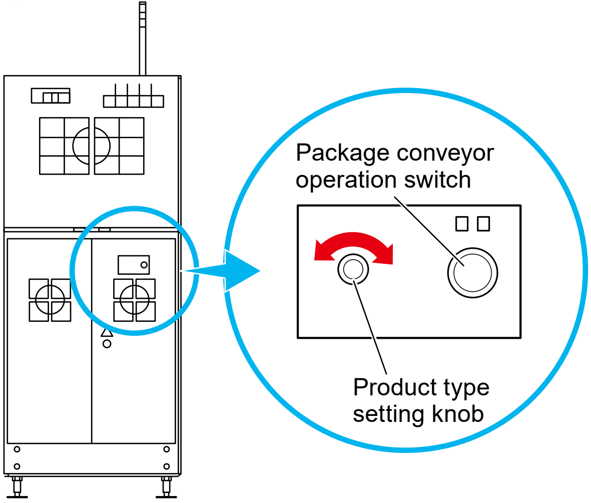
[Manual Stop]

Pressing the switch again during drive cycle operation stops the operation.

[Auto Stop]

Operation automatically stops when the package detection sensor located on the end of the machine does not detect any package for a certain amount of time.

* The auto stop time varies depending on the machine length.



Tray level control

This function stops and re-starts operation for the winding unit per span, depending on the supply bobbin status of the winding unit. The tray detection sensor attached to each span detects the bobbin supply status.

* This function comes standard with the Bobbin Tray and is optional on Link Coner.

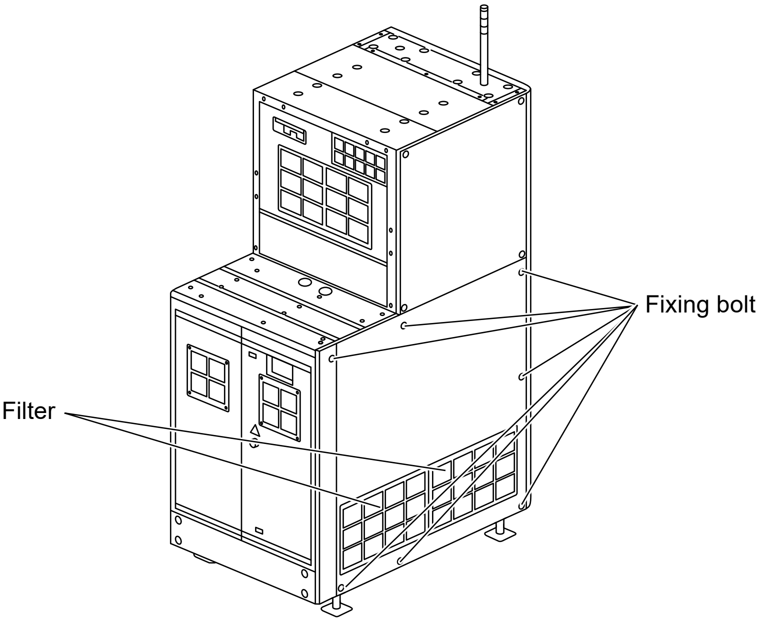
* The criteria for the auto stop and restart operation for the winding unit are set on the VOS.

Main control box

- **Inspection & cleaning**

The temperature inside the main control box will increase if yarn waste, cotton fly or other contaminants have built up on the box's filter. This temperature increase can reduce the life of the electrical components or damage them.
In addition, the VOS panel may rise or pop up if the pressure inside the box increases.

Frequency	Item	Guideline
Monthly	Filter	• Remove the side cover of the main control box and clean from the inside part of the cover using an air gun, etc. * Loosen the seven fixing bolts, and remove the side cover. • Check for clogging



Blower inverter

- **Replacement procedure**

Refer to the inverter instruction manual for details.

1. **Remove the detachable terminal with parameter back-up function from the new inverter.**
2. **Turn off the main switch on the main control box.**

   Wait until the inverter CHARGE lamp goes out.
3. **Remove the detachable terminal with parameter back-up function from the damaged inverter.**

   * It is not necessary to remove the cable connected to the detachable terminal with parameter back-up function.
4. **Replace the damaged inverter with the new one and attach in original locations.**
5. **Attach the detachable terminal with parameter back-up function**
6. **Check there are no shorts or earth faults with the circuits connected to the inverter.**
7. **If there are no problems, turn ON the main switch in the machine control box.**
8. **Test run the machine and check there are no problems with functionality.**

Return conveyor inverter, package conveyor inverter

- **Replacement procedure**

Replace after checking “9 Maintenance and inspection precautions” in the inverter instruction manual.

1. **Turn off the main switch on the main control box.**

   * Use a tester to verify that the voltage is 30 V or below after 10 minutes have elapsed after the power is cut off.
2. **Disconnect the wiring from the damaged inverter, and replace with the new inverter.**
3. **Reconnect the wiring to the new inverter.**
4. **Check there are no shorts or earth faults with the circuits connected to the inverter.**
5. **If there are no problems, turn ON the main switch in the machine control box.**
6. **Refer to the electrical drawings and set the parameters.**
7. **Test run the machine and check there are no problems with functionality.**

Consumables

Main Switch UVT (Undervoltage trip device)

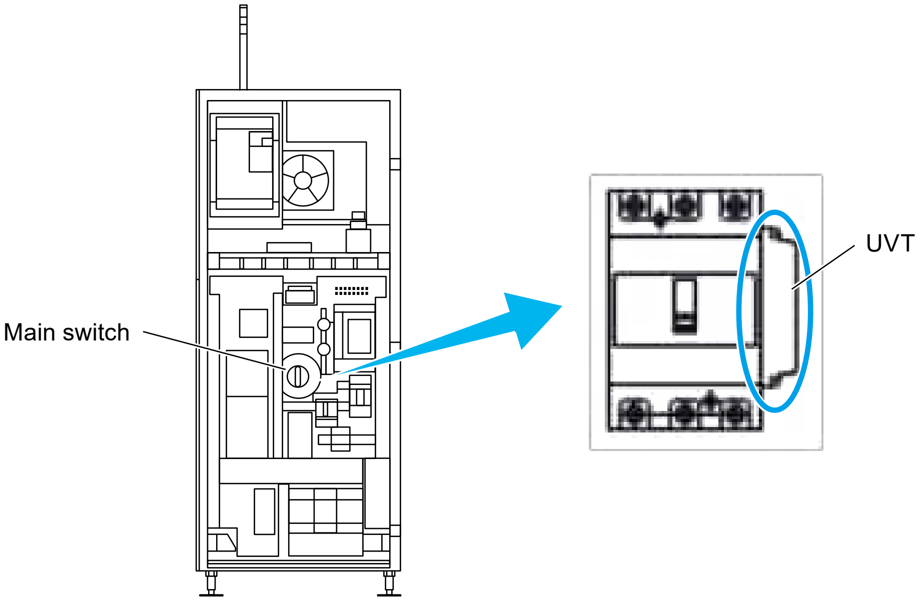
The main switch is equipped with a UVT (Undervoltage trip device) as an accessory device.
This device trips the main switch to prevent a malfunction or machine damage while recovering from the power outage, or when the factory experiences a drop or low electrical power voltage.

The UVT has a product lifespan. If the life of the UVT is exceeded, it will stop tripping even when the trip conditions are met.
(No. of trips lifespan for UVT function: 3500 trips)

* When the operator turns OFF the main switch, this operation does not impact the lifespan.

If the main switch does not trip during a power outage, replace the UVT with a new device.

* For further details on the replacement procedure, refer to the “UVT Device Installation Guide” that is provided with the UVT.



7
Chapter

VOS

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  <11450> Vibration alarm settings
  <11500> Winding unit operation adjustment
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  <12100> Main machine basic settings
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<23600> Simulation of number of winding units
<23620> Production quantity prediction
<24000> Unit basic data
<23300> Unit splicing error cause
<23400> Unit yarn breakage cause
<23500> Unit forced ejection cause
<25100> AD basic data
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<41520> Inspector SPC replacement
<41620> MCU replacement
<41310> AD check mode
<41720> VOS maintenance
<42800> Update > Data management
<42100> Update > VOS/MCU

<42300> Update > Units
<42700> Update > Driver
<42200> Update > Main machine
<42400> Update > AD
<42510> Update > CBF
<42520> Update > Supply units
<42530> Update > Spin inspector
<43110> Hour meter
<44200> Unit alarm summary
<44100> Main machine alarm summary
<44300> AD alarm summary
<44400> CBF alarm summary
<44500> Spin inspector alarm summary
<45100> Life of the machine alarm logs
<45300> Unit alarm logs
<45200> Main machine alarm logs
<45400> AD alarm logs
<45500> CBF alarm logs
<45600> Spin inspector alarm logs
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<51100> Lot allocation
<51200> Lot deletion
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<51600> Unit lot change
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<61100> Change password of access level
<61210 - 61240> Access property (settings)
<61310> Access property (maintenance)
<61610> Access property (setting management)
<61410 - 61420> Access property (manager)
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<62200> Display settings
<62300> Viewer
<63300> Unit specification settings
<41140> Omit winding unit setting
<64100> Report format settings
<65100> Shift schedule
<65200> Cleaning
<65300> Test shift
<66110 - 66150> Lot batch settings 1 - package (production)
<66210 - 66270> Lot batch settings 1 - package (quality)
<66310 - 66340> Lot batch settings 1 - unit alarm
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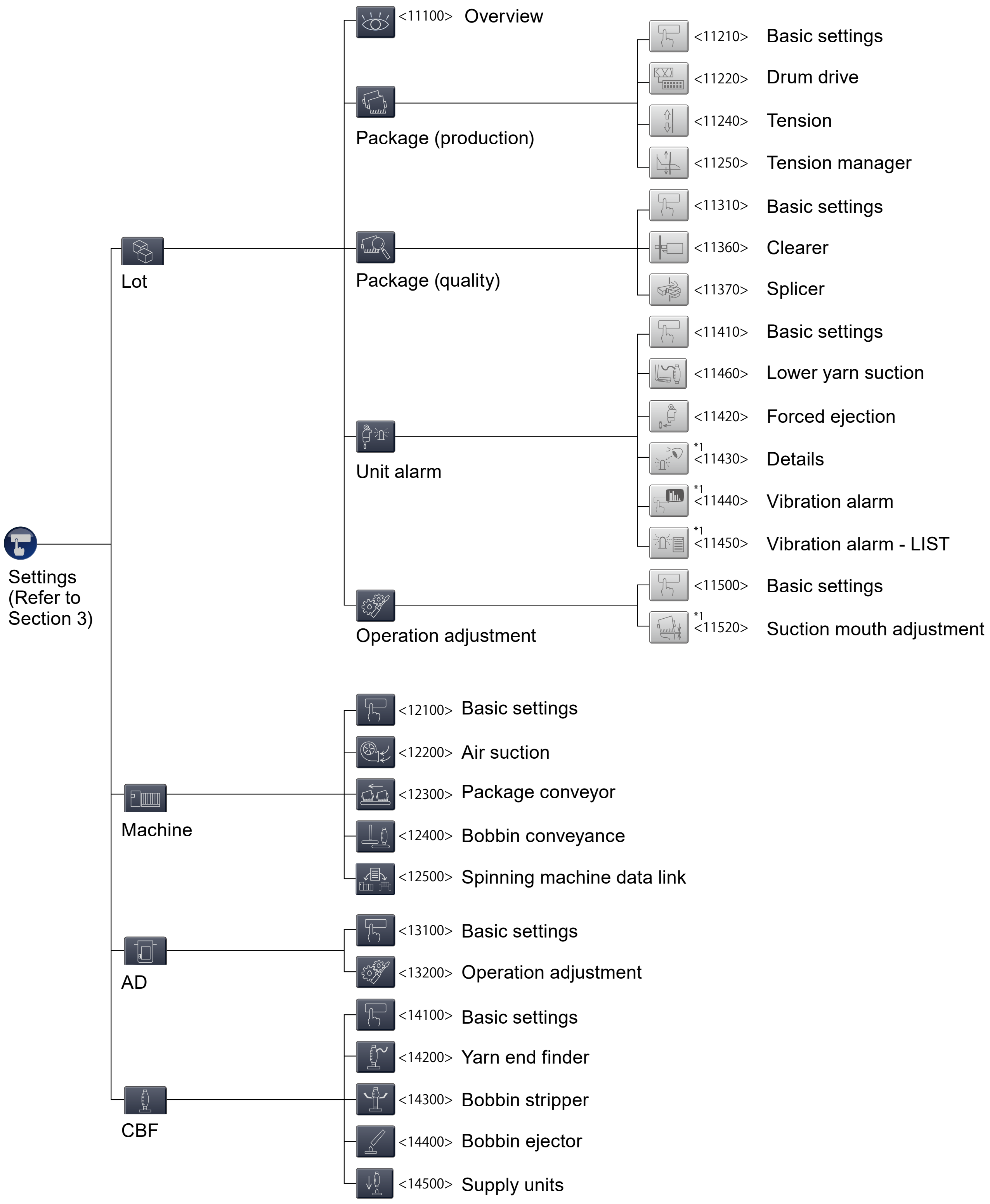
Screen ID & access level



- Settings (Refer to Section 3)
  - Lot
    - <11100> Overview
    - Package (production)
      - <11210> Basic settings
      - <11220> Drum drive
      - <11240> Tension
      - <11250> Tension manager
    - Package (quality)
      - <11310> Basic settings
      - <11360> Clearer
      - <11370> Splicer
    - Unit alarm
      - <11410> Basic settings
      - <11460> Lower yarn suction
      - <11420> Forced ejection
      - *1 <11430> Details
      - *1 <11440> Vibration alarm
      - *1 <11450> Vibration alarm - LIST
    - Operation adjustment
      - <11500> Basic settings
      - *1 <11520> Suction mouth adjustment
  - Machine
    - <12100> Basic settings
    - <12200> Air suction
    - <12300> Package conveyor
    - <12400> Bobbin conveyance
    - <12500> Spinning machine data link
  - AD
    - <13100> Basic settings
    - <13200> Operation adjustment
  - CBF
    - <14100> Basic settings
    - <14200> Yarn end finder
    - <14300> Bobbin stripper
    - <14400> Bobbin ejector
    - <14500> Supply units

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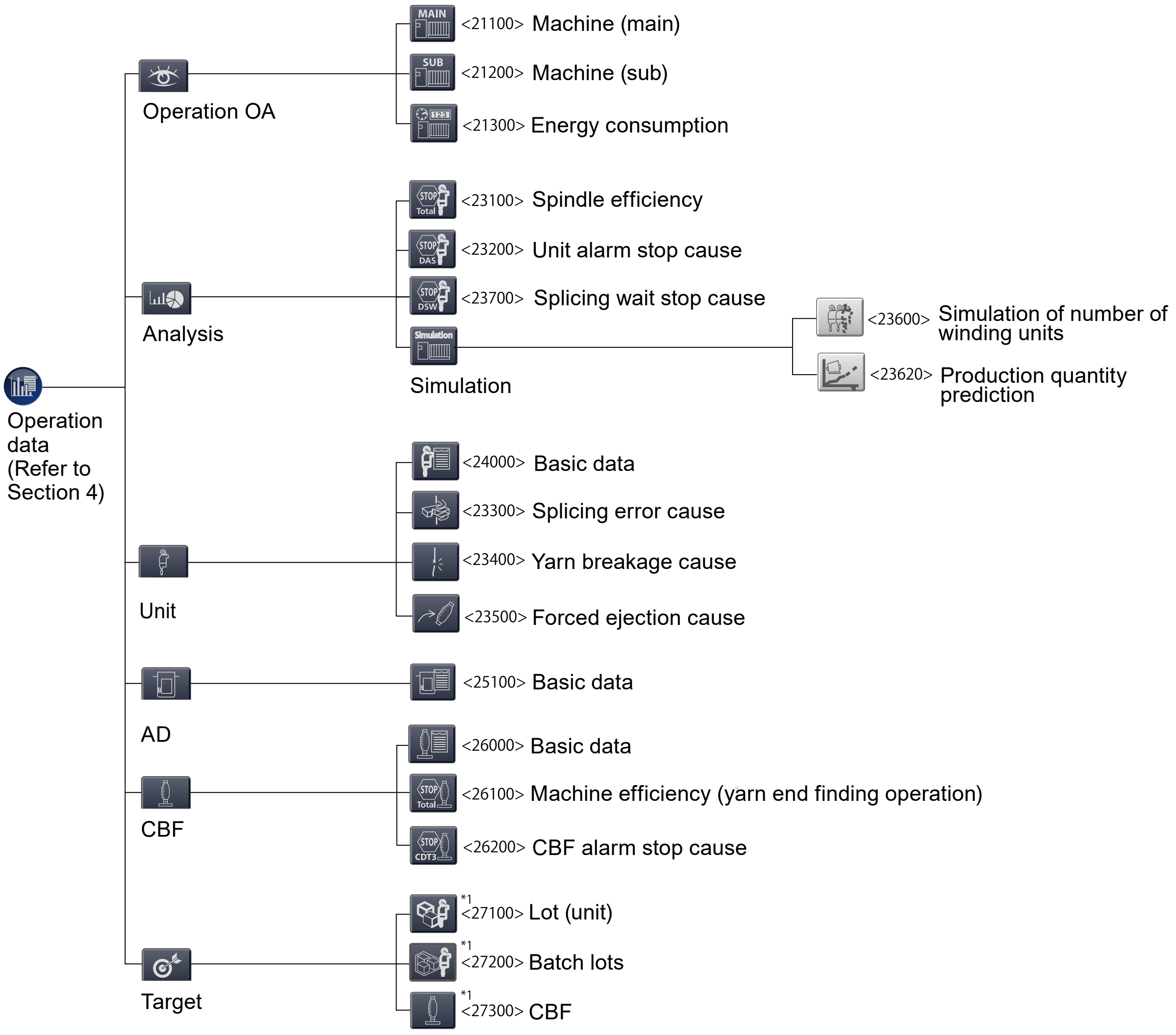
*1 You must get MAINTENANCE or ADMINISTRATOR authorization.


Operation data (Refer to Section 4)
Operation OA
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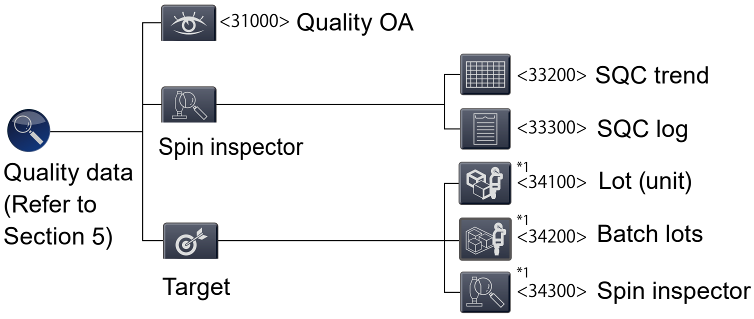
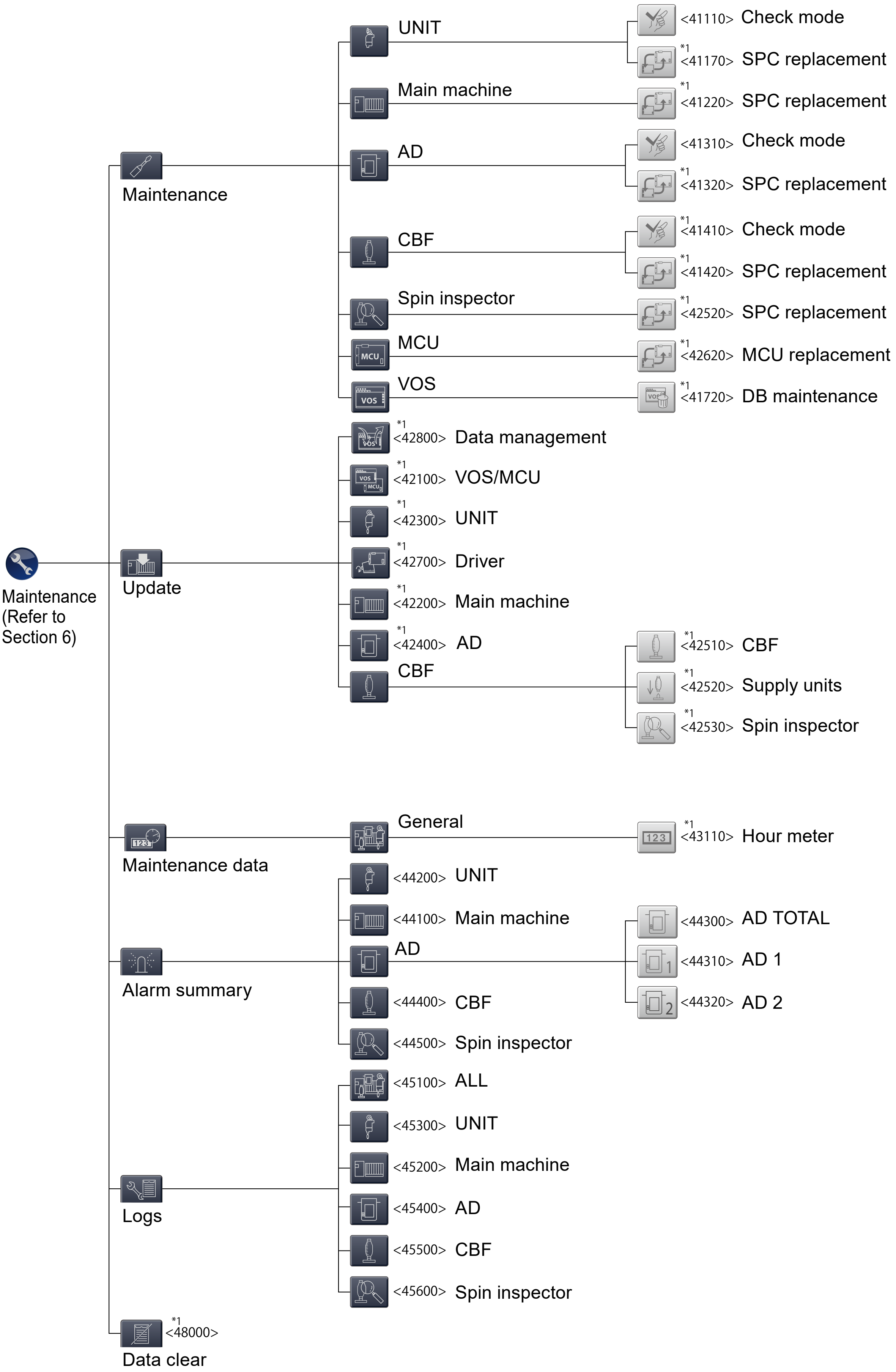
<21200> Machine (sub)
<21300> Energy consumption
Analysis
<23100> Spindle efficiency
<23200> Unit alarm stop cause
<23700> Splicing wait stop cause
Simulation
<23600> Simulation of number of winding units
<23620> Production quantity prediction
Unit
<24000> Basic data
<23300> Splicing error cause
<23400> Yarn breakage cause
<23500> Forced ejection cause
AD
<25100> Basic data
CBF
<26000> Basic data
<26100> Machine efficiency (yarn end finding operation)
<26200> CBF alarm stop cause
Target
*1 <27100> Lot (unit)
*1 <27200> Batch lots
*1 <27300> CBF

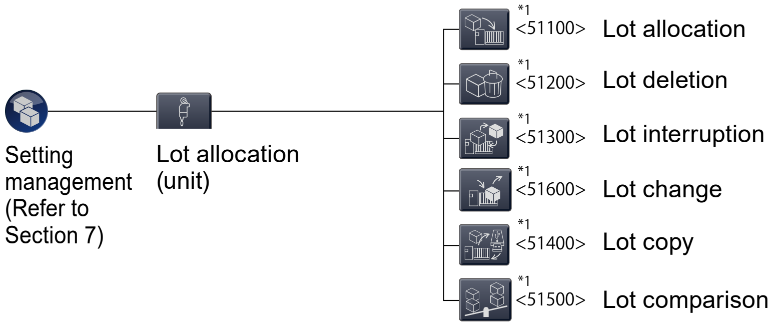

Quality data (Refer to Section 5)
<31000> Quality OA
Spin inspector
<33200> SQC trend
<33300> SQC log
Target
*1 <34100> Lot (unit)
*1 <34200> Batch lots
*1 <34300> Spin inspector

---

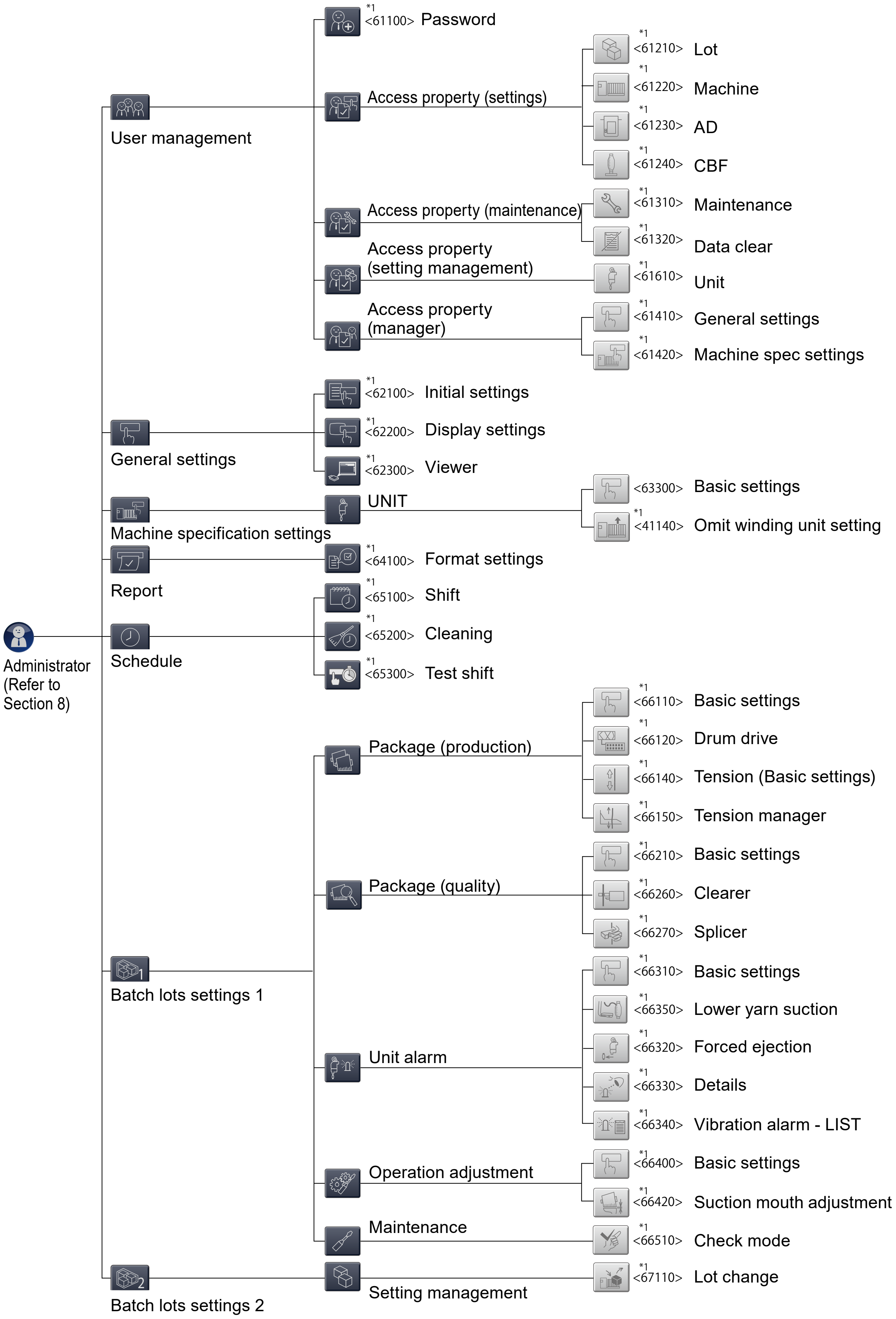
*1 You must get MAINTENANCE or ADMINISTRATOR authorization.


Maintenance (Refer to Section 6)
Maintenance
UNIT
<41110> Check mode
*1 <41170> SPC replacement
Main machine
*1 <41220> SPC replacement
AD
<41310> Check mode
*1 <41320> SPC replacement
CBF
*1 <41410> Check mode
*1 <41420> SPC replacement
Spin inspector
*1 <42520> SPC replacement
MCU
*1 <42620> MCU replacement
VOS
*1 <41720> DB maintenance
Update
*1 <42800> Data management
*1 <42100> VOS/MCU
*1 <42300> UNIT
*1 <42700> Driver
*1 <42200> Main machine
*1 <42400> AD
CBF
*1 <42510> CBF
*1 <42520> Supply units
*1 <42530> Spin inspector
Maintenance data
General
*1 <43110> Hour meter
Alarm summary
<44200> UNIT
<44100> Main machine
AD
<44300> AD TOTAL
<44310> AD 1
<44320> AD 2
<44400> CBF
<44500> Spin inspector
Logs
<45100> ALL
<45300> UNIT
<45200> Main machine
<45400> AD
<45500> CBF
<45600> Spin inspector
*1 <48000>
Data clear

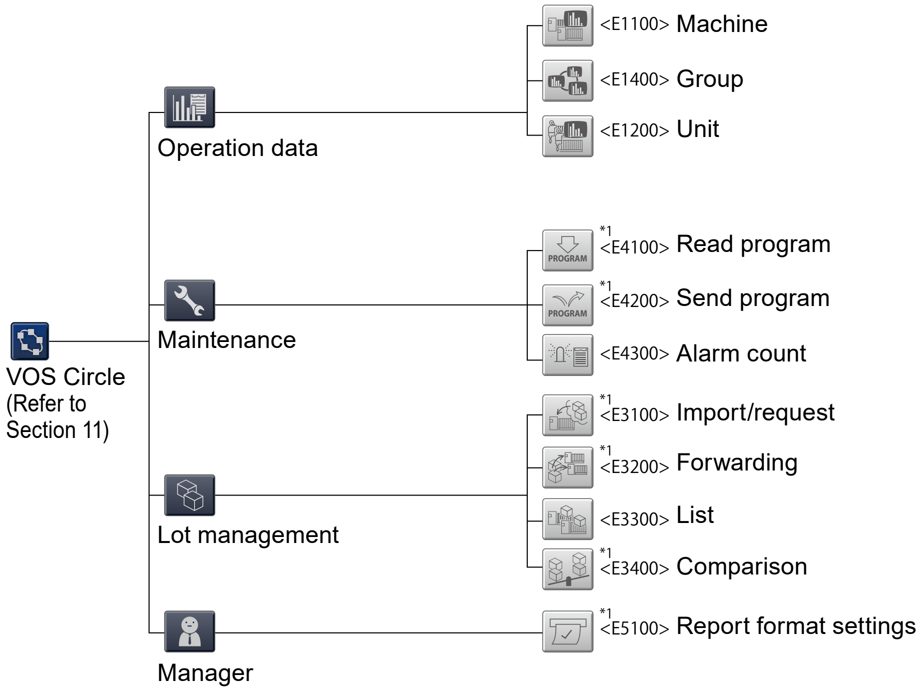
[1] You must get MAINTENANCE or ADMINISTRATOR authorization.


Setting management (Refer to Section 7)
Lot allocation (unit)
*1 <51100> Lot allocation
*1 <51200> Lot deletion
*1 <51300> Lot interruption
*1 <51600> Lot change
*1 <51400> Lot copy
*1 <51500> Lot comparison

[1] You must get MAINTENANCE or ADMINISTRATOR authorization.


Administrator
(Refer to Section 8)
User management
*1 <61100> Password
Access property (settings)
*1 <61210> Lot
*1 <61220> Machine
*1 <61230> AD
*1 <61240> CBF
Access property (maintenance)
*1 <61310> Maintenance
*1 <61320> Data clear
Access property (setting management)
*1 <61610> Unit
Access property (manager)
*1 <61410> General settings
*1 <61420> Machine spec settings
General settings
*1 <62100> Initial settings
*1 <62200> Display settings
*1 <62300> Viewer
Machine specification settings
UNIT
<63300> Basic settings
*1 <41140> Omit winding unit setting
Report
*1 <64100> Format settings
Schedule
*1 <65100> Shift
*1 <65200> Cleaning
*1 <65300> Test shift
Batch lots settings 1
1
Package (production)
*1 <66110> Basic settings
*1 <66120> Drum drive
*1 <66140> Tension (Basic settings)
*1 <66150> Tension manager
Package (quality)
*1 <66210> Basic settings
*1 <66260> Clearer
*1 <66270> Splicer
Unit alarm
*1 <66310> Basic settings
*1 <66350> Lower yarn suction
*1 <66320> Forced ejection
*1 <66330> Details
*1 <66340> Vibration alarm - LIST
Operation adjustment
*1 <66400> Basic settings
*1 <66420> Suction mouth adjustment
Maintenance
*1 <66510> Check mode
Batch lots settings 2
2
Setting management
*1 <67110> Lot change

[1] You must get MAINTENANCE or ADMINISTRATOR authorization.


VOS Circle
(Refer to Section 11)
Operation data
Maintenance
Lot management
Manager
<E1100> Machine
<E1400> Group
<E1200> Unit
*1 <E4100> Read program
*1 <E4200> Send program
<E4300> Alarm count
*1 <E3100> Import/request
*1 <E3200> Forwarding
<E3300> List
*1 <E3400> Comparison
*1 <E5100> Report format settings
PROGRAM
PROGRAM

[1] You must get MAINTENANCE or ADMINISTRATOR authorization.

Pre I Introduction

This instruction manual describes the function and operating method of the VOS software package.
Be certain to read this manual thoroughly before using the VOS software package.

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mss-customer-support@syd.muratec.co.jp

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Edited by: Documentation Team

Sec 1 General description

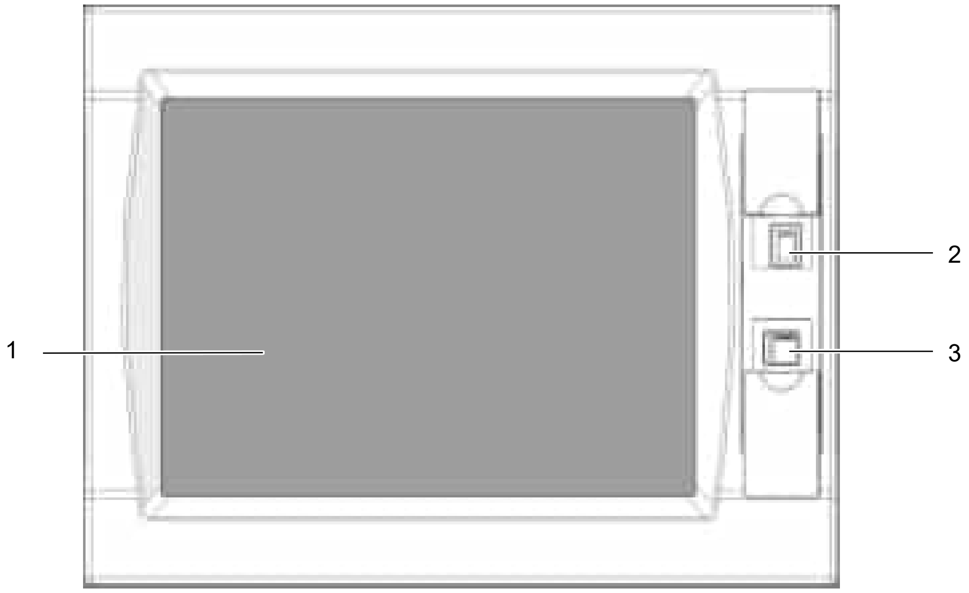
1-1 Visual on-demand system (VOS)

This system enables the user to conduct a wide variety of tasks, from machine operation condition settings and input to production status monitoring operations, such as machine efficiency and yarn quality management.

The following operations and monitoring can be conducted on the VOS.

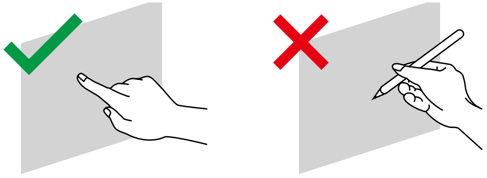
- Inputting settings for all types of operation condition
- Saving, allocating and deleting lot settings
- Displaying data on machine operation status and data analysis results
- Setting all maintenance modes
- Displaying machine alarm status and log
- Obtaining machine operation data using a USB memory

1-2 Hardware configurations



CAUTION

Be sure to always use your finger to operate the touch panel.
Do not use hard, sharp objects, like the tip of a pen, to operate the touch panel. Using such objects will damage the touch panel.



1) LCD color touch panel
This touch panel is a 15 inch color LCD. Touch the screen directly to operate.

2) USB connector
If you insert a USB memory, you can obtain a machine setting report, an operation report or copy data from a screenshot.

3) LAN connector
This connector is for use by Murata service technicians.

1-3 Access level management

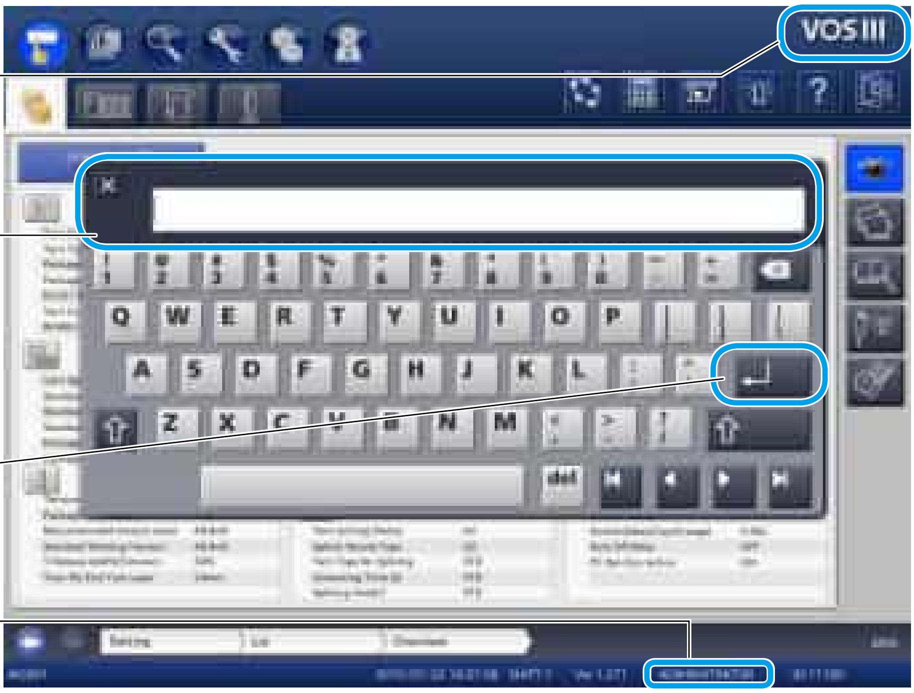
The VOS is equipped with access levels that support each user. The content and operations available to the user vary depending on each level.

[Overview of access levels]

Access level Available operations	OPERATOR	MAINTENANCE	ADMINISTRATOR
Browse setting and monitoring items	○	○	○
General operation and maintenance setting changes	---	○	○
Management setting changes such as machine specifications, display settings and passwords	---	---	○

* The screen displayed will differ depending on access level. Refer to Chapter 7 Contents, "***Screen ID & Access Level***" for access levels.

1-4 Switching access levels

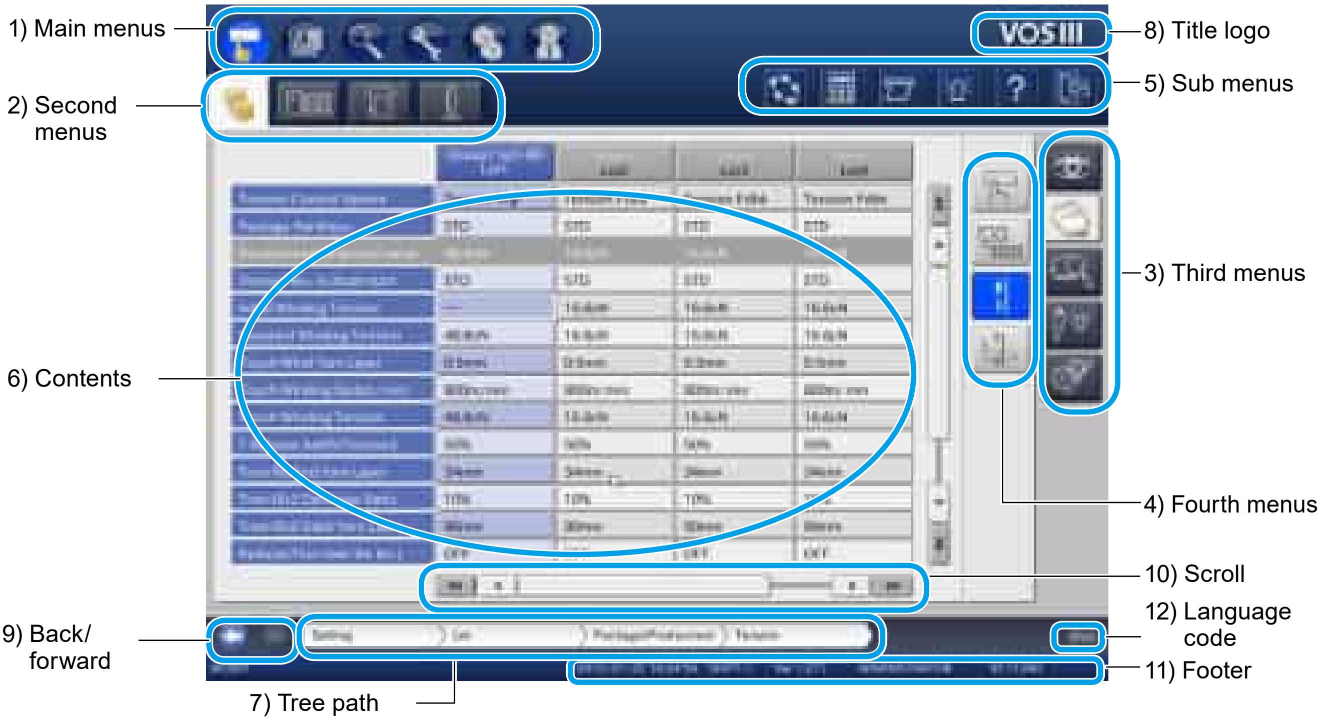


1. **Touch the title logo to display the keyboard.**
2. **Input the password for each access level.**
   * Murata service technicians will specify the password default settings during installation.
3. **Touch the Enter key.**

* If no VOS operation has been performed within a set time, the system automatically returns to the OPERATOR Level.

Sec 2 Settings

2-1 Screen features


1) Main menus
2) Second menus
6) Contents
9) Back/ forward
7) Tree path
8) Title logo
VOS III
5) Sub menus
3) Third menus
4) Fourth menus
10) Scroll
12) Language code
11) Footer

1) Main menu

The categories: [Settings], [Operation Monitoring], [Quality], [Maintenance], [Setting management] and [Administrator] are divided and displayed with icons. Select the screen you require from this menu.

[Settings]
This screen is for creating new lots and making setting changes.

[Operation monitoring]
This screen displays data on machine operation status and data analysis results.

[Quality]
This screen displays the bobbin and package quality related data. The spin inspector (Link Coner) also shows data on defective or faulty bobbins.

[Maintenance]
This screen performs maintenance operations, such as all maintenance mode settings, alarm history and program downloading.

[Setting management]
This screen performs operations such as allocating and deleting lots.

[Administrator]
This screen performs all the basic settings, such as time, unit, switching the language, shift time and machine specification settings.

2) Second menus
3) Third menus
4) Fourth menus

The content for the main menu is divided further into different types of menus: 2) to 4). The menu system displays up to 4 levels.
If you select the icon you want, the corresponding screen will be displayed.

5) Submenus
Apart from the main menu, these submenus display frequently used screens and functions.

	[VOS Circle] This displays the operation screen for the VOS Circle.
	[Calculator] This calculator can be used on the VOS screen.
	[Data output] This displays the menu for obtaining settings and shift reports, or a hardcopy of the screen.
	[Alarm] This screen displays each type of alarm that occurs on the machine. It turns red and flashes only when an alarm occurs.
?	[Help] This key displays help available for setting items and data. After touching this key, select the appropriate item. The help screen stays open and available for searches when the user presses and holds the key.
	[Menu map] This key displays a ten-key input screen. Use this key as a shortcut.

6) Contents
The content selected from menus 1) to 5) is displayed.

7) Tree path
The path selected from menus 1) to 5) is displayed using a written description. By checking this path, you can confirm the location of the screen currently displayed.

8) Title logo
Touching the title logo will display the access level login screen.

9) Back/ forward
You can return or advance to screens previously visited.

10) Scroll
If the entire description cannot be displayed on one screen, a scroll bar is displayed.
You can scroll down one line at a time, or advance to the next page.

11) Footer
This displays the date, time, current shift, VOS software version, access level and display screen ID.

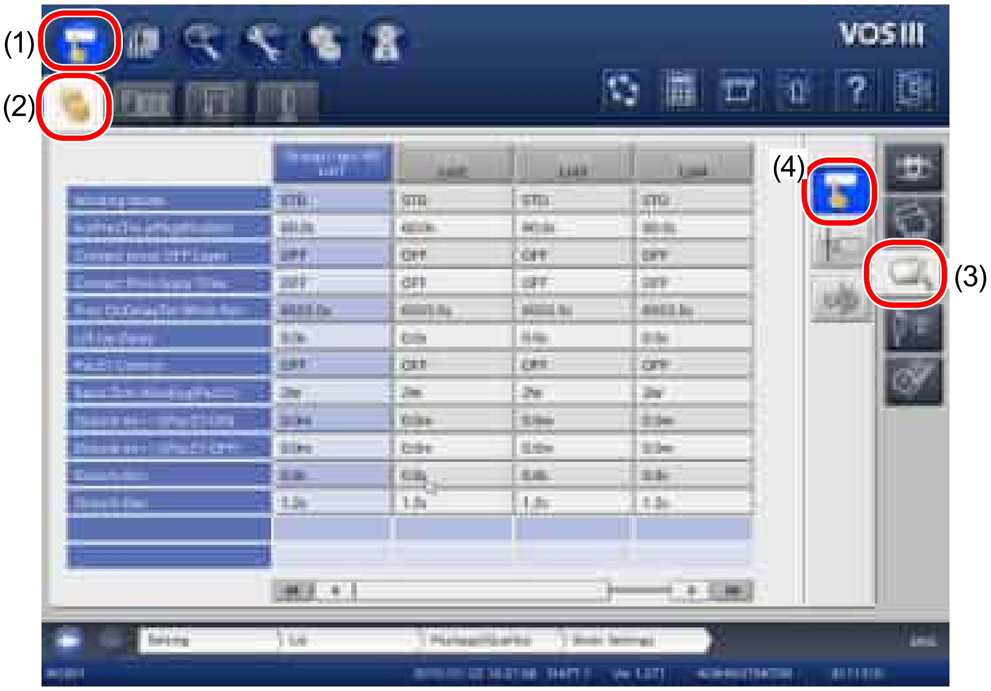
12) Language code
If the language No.1 and No.2 settings are different, the display language can be switched back and forth by touching the language code that identifies the particular language. If VOS is not used after a certain time period, it automatically returns to language No.1.
Refer to <62100> Initial Settings> in Section 8 for details on the language No.1 and No.2 settings.

2-2 Screen transition

Touching icons for screen transition

By touching the icons in order: (1) main menu, (2) second menu, (3) third menu, (4) fourth menu, the display will transition to the corresponding screen.

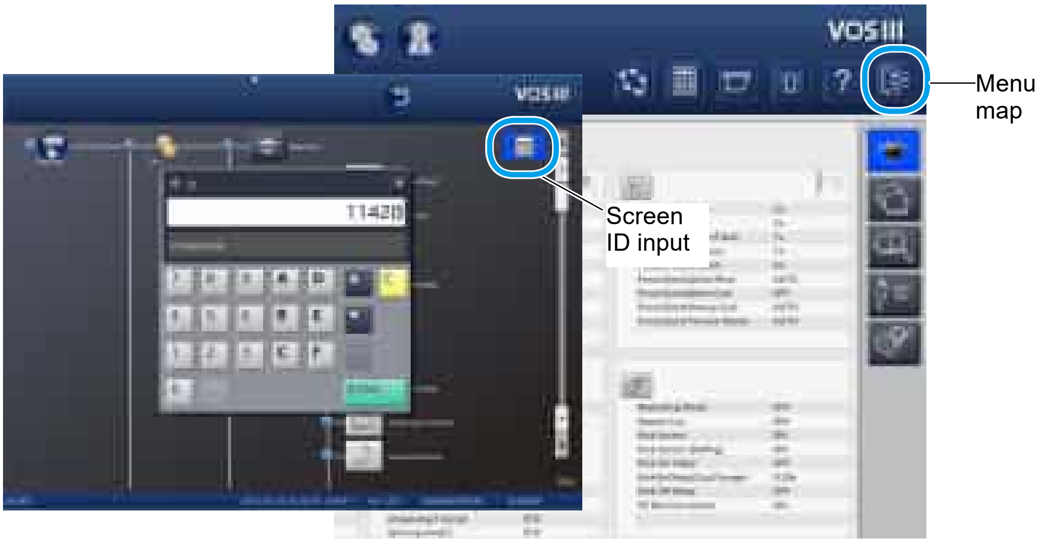
* This instruction manual has procedures for each menu screen: (1) through (4). Depending on the screen, there is sometimes no icon display for (3) and (4).



Inputting screen ID for screen transition

Input the number for the screen ID to transition to the corresponding screen. Refer to Chapter 7, Contents, “***Screen ID & Access Level***” for the corresponding screen ID.

1. **Login to the access level that displays the screen you want. (Refer to Chapter 7, 1-3)**
2. **First touch the menu map and then the screen ID icon.**
3. **Input the number for the screen ID, and then touch “Enter.”**



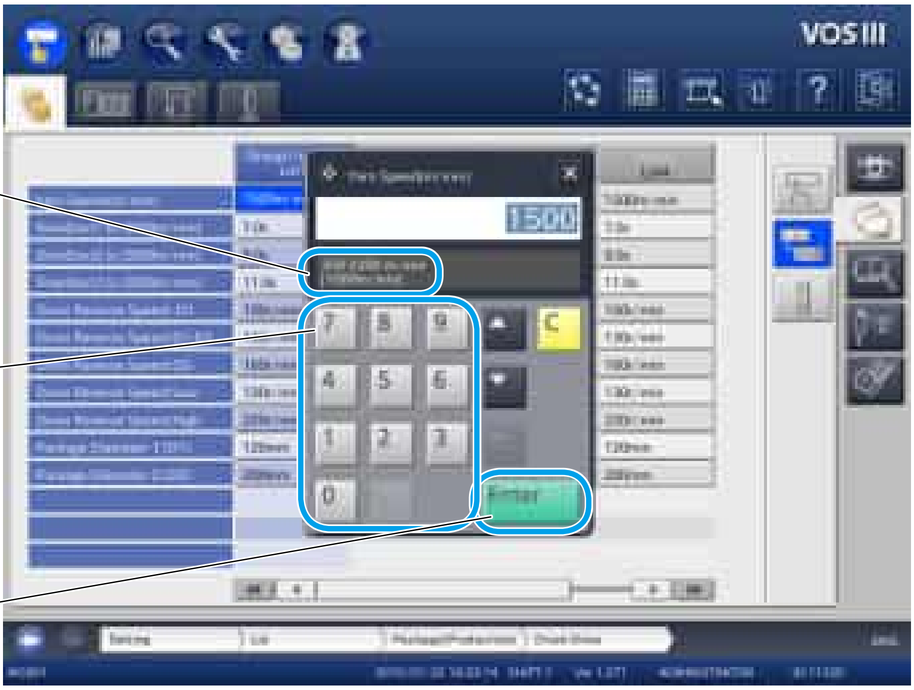
2-3 Setting input

There are 3 methods for inputting the setting value. Depending on the input item, one of the input screens will display.

* The setting value can be changed by logging in through the prescribed access level. Refer to Chapter 7, 1-4 for access level changes.

Entering numerical values

The number ten-key will be displayed for items that require number input.


VOS III
1500
7
8
9
4
5
6
1
2
3
0
C
Enter

Setting input range
* The value inside the parenthesis is the default setting.

1. **Input the value for the setting using the number ten-key.**

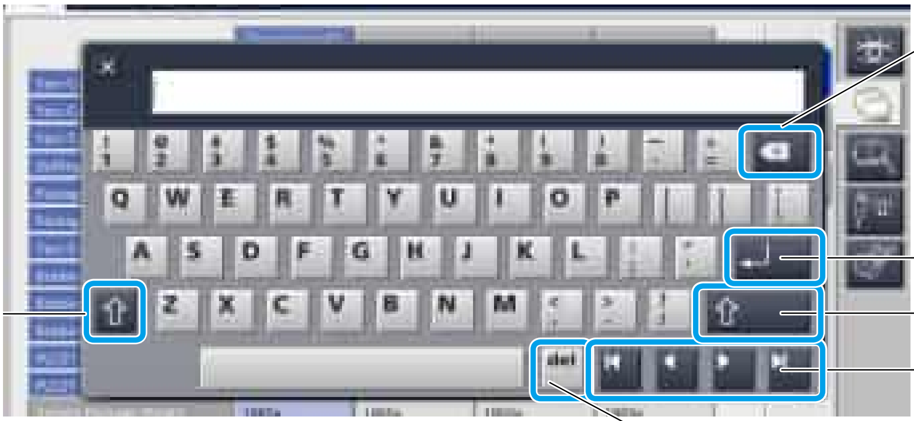
   * Touching either ▲ or ▼, enables smaller value adjustments to be made.

   * If you make an input mistake, touch C.

2. **Touch “Enter.”**

Entering characters

The keyboard will be displayed for items that require letter input.

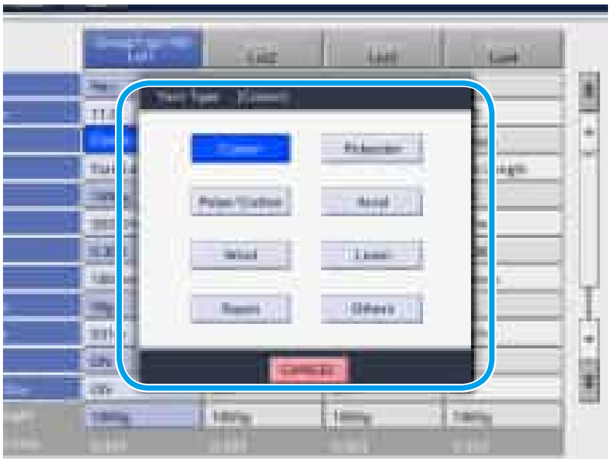

Back space key
Enter key
Shift key
Shift key
Move cursor
Delete key
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
del

⌫	Deletes the letter in front of the cursor.
↵	Enters or confirms letter input.
⇧	Touching the shift key switches the letters to lowercase or uppercase and switches the number keys to symbols. In addition, press and hold the shift key to lock it.
⏮ ◀ ▶ ⏭	Touching these arrow keys moves the position of the cursor. You can move the cursor position by one letter, or to the start and end of the line.
del	Deletes the letter behind the cursor.

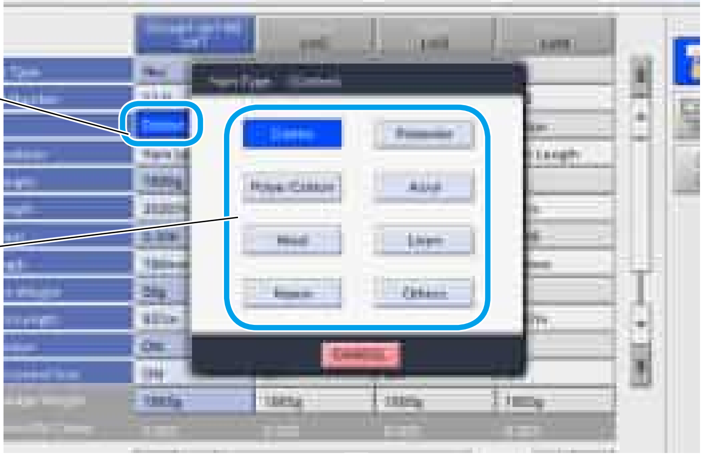
Item selection input

A pop-up window is displayed when only one item selection is required from multiple choices.
Select the applicable setting from the choices available.

* To close the pop-up window, touch “Cancel.”

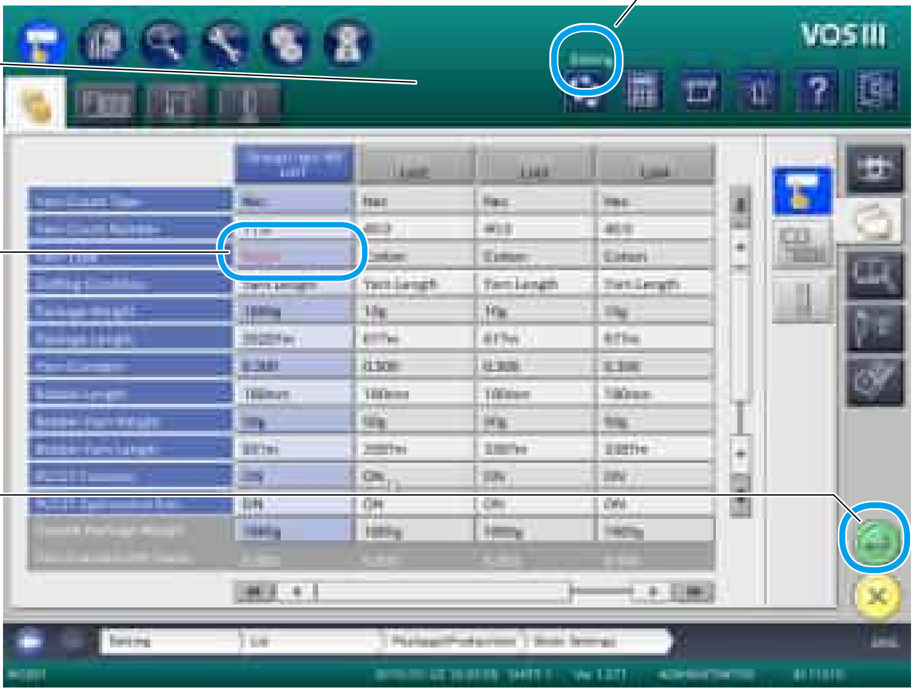

Cotton
Polyester
Polyes/Cotton
Acryl
Wool
Linen
Rayon
Others
CANCEL

2-4 Editing & confirming the setting



1. **Touch the setting you want to change.**

2. **Select an item, or input a value, and confirm the setting.**



Editing mark

The background turns green during the editing operation, and it turns dark blue after the setting is completed.

The changed setting display turns red.

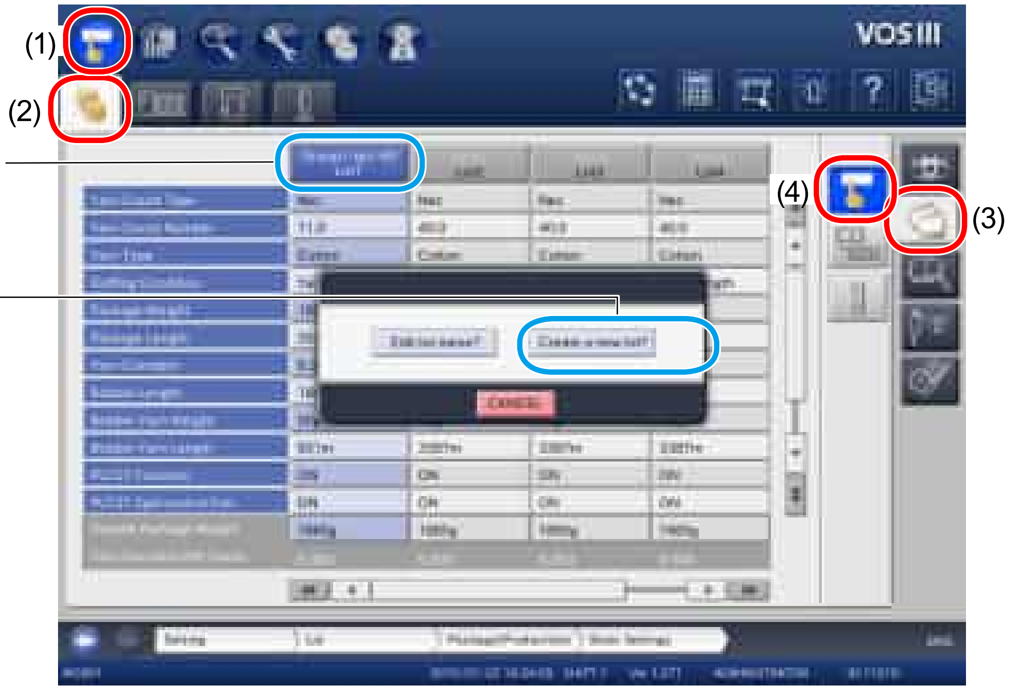
3. **Touch “Confirm.”**
The setting is sent to the system.

* If the send operation fails, the system name for the send error location will be displayed.

Create new lot

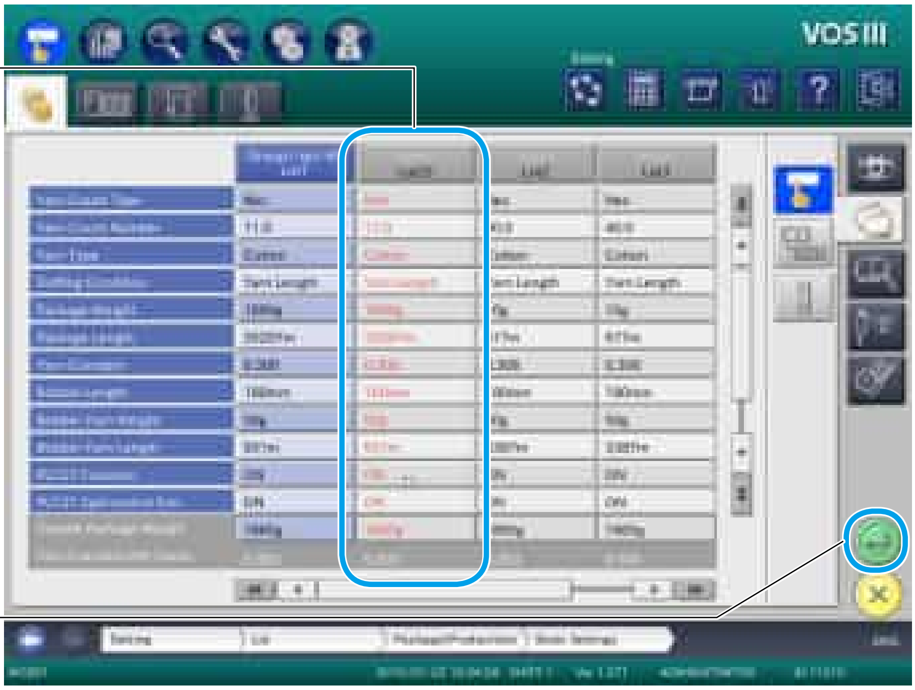
You can create a new lot from any screen related to the lot settings.

1. **Touch (2), (3) and then (4).**
   The lot creation screen will be displayed.



2. **Touch the lot you want to copy.**

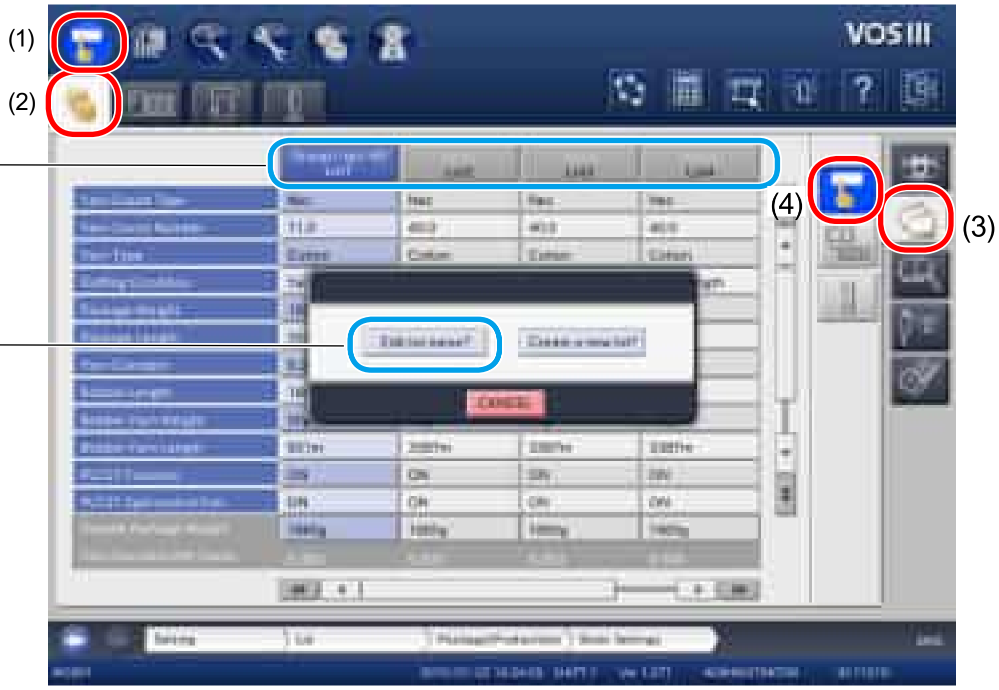
3. **Touch “Create a new lot.”**



4. **The selected lot will be copied, so input the new lot name and settings.**

5. **Touch “Confirm.”**

Change lot name



1. **Touch “Lot.”**

2. **Touch “Edit lot name.”**

3. **Input the lot name, and touch “Confirm.”**
   The lot name will change.

2-5 List of data code

AAT%	AD alarm down time [%]
ADS%	AD down time [%]
ADT%	AD doffing cycle time ratio [%]
ADTR	AD troubles
AEF%	Actual production eff [%]
ART%	AD run time [%]
ASTM	Spindle alarm down time [min]
ATT%	AD running time ratio [%]
AUKG	Air / production quantity [L/kg]
AUKG(C)	Air / production quantity (calc) [L/kg]
AULB	Air / production quantity [L/lb]
AULB(C)	Air / production quantity (calc) [L/lb]
AWT%	AD wait time [%]
CC/Y	No. of C cut/100km
CCm/Y	No. of CCm defects/100 km
CCp/Y	No. of CCp defects/100 km
CDT%1	Empty bob rtrn wait ratio [%]
CDT%2	Full bob supply wait ratio [%]
CDT%3	CBF alarm stop time ratio [%]
CDT%4	CBF stop time ratio [%]
CDT%5	CBF operator call time ratio [%]
CDT%6	CBF other time ratio [%]
CDTM	CBF down time [min]
CDTM1	Empty bob return wait time [min]
CDTM2	Full bob supply wait time [min]
CDTM3	CBF alarm stop time [min]
CDTM4	CBF stop time [min]
CDTM5	CBF operator call time [min]
CDTM6	CBF other time [min]
CEF%	CBF eff (Yrn end find op) [%]
Cm/Y	No. of Cm defects/100 km
Cp/Y	No. of Cp defects/100 km
CRTM	CBF running time [min]
CWTM	Waiting time for Spg. [min]
CYFTM	CBF yarn end find time [min]
DAS%	Unit alarm down time [%]
DFP%	Full pkg down time [%]
DOF%	Successful doffing ratio [%]

DOS%	Other down time [%]
DSC%	Splice cycle time [%]
DSW%	Splice wait down time [%]
DSW%1	CBF supply stop time ratio [%]
DSW%2	Return C/V full time ratio [%]
DSW%3	Feed C/V tray jam time ratio [%]
DSW%4	Tray level cont time ratio [%]
DSW%5	Sequen start wait time ratio [%]
DSW%6	Bobbin supply err time ratio [%]
DSW%7	Other cause time ratios [%]
DUO%	Winding unit down time [%]
EPC	Power consumption [kWh]
EPC(C)	Power cons (calc val) [kWh]
EUKG	Power/production quantity [kWh/kg]
EUKG(C)	Power/production quantity (calc) [kWh/kg]
EULB	Power/production quantity [kWh/lb]
EULB(C)	Power/production quantity (calc) [kWh/lb]
FBE%	Full package discharge ratio [%]
FC/Y	FF/F/DM defects/100km
FPTM	Full package dwn tm [min]
FSS1	Full bob avg supply speed [pcs/min]
FSS2	Full bob max supply speed [pcs/min]
FSS3	Full bob min supply speed [pcs/min]
HC/Y	H/SFI/D cuts/100km
HWKG%(C)	Hard waste ratio (calc val) [%]
HWKG(C)	Hard waste vol (calcval) [kg]
HWLB%(C)	Hard waste ratio (calc val) [%]
HWLB(C)	Hard waste vol (calc val) [lb]
IFR	Air consumption [L]
IFR(C)	Air consump (calc val) [L]
Jm/Y	No. of Jm/100 km
JO/P	Splicing/Pkg (Ave)
JO/Y	No. of splicing/100km
Jp/Y	No. of Jp/100 km
LC/Y	No. of L cuts/100km
MC/Y	No. of MC defects/100 km
MCM%	No. clr. zero adjust miss [%]
MF/Y	MF/F-CLS cuts/100km

MIS%	Mis-splicing ratio[%]
MLB%	Bobbin supply error [%]
MLC%	Mis% by lay-in cuts [%]
MLW%	Mis% by no lower yarn [%]
MR/Y	MOIRE cuts/100km
MSL%	Mis% by splicer misses [%]
MSM%	Splice monitor cuts [%]
MSY%	System errors [%]
MUP%	Mis% by no upper yarn [%]
NACT	No. of CBF yarn end finding
NADA	No. of AD actions
NADM	No.of mis-auto doffing
NATM	No. of attempts/spindle
NATM/P1	Splicing attempts/P1 alarm
NBSA	No. of stripper rmvl
NC/Y	No. of N cut/100km
NCC	C cuts
NCCm	No. of CCm cuts
NCCp	No. of CCp cuts
NCm	No. of Cm cuts
NCOP	No. of bobbins
NCp	No. of Cp cuts
NCTB	No. of CBF troubles
NDOF	No. of doffing
NESP	No. of empty bob supplied
NFBE	No. of full bobbins
NFC	No. of FF/F/DM defects
NFCM	No. of forced ejects (CMT)
NFCV	No.of forced ejects (CV/VCV)
NFCY	No.of forced eject (CY ALM)
NFEJ	No. of force ejects
NFFF	No.of forced ejects (FF/F/DM)
NFH	No.of forced ejects(H/SFI/D)
NFIP	No. of forced ejects (IPI)
NFMA	Forced ejections (manual)
NFMF	No.of forced ejects (MF/F-CLS)
NFML	Force ejects (lwr yarn err)
NFMR	No.of forced ejects (MOIRE)

NFND	No. of yarn end; found
NFO	Forced ejections (other)
NFOT	No.of forced ejects (Othr.tex.alm)
NFPC	No.of force ejects (PF/CLS/IPM)
NFSC	Force eject (Splice cut)
NFSM	Force eject (Splice miss)
NFSU	Force eject (Startup cut)
NFTB	Force eject (Tension break)
NFYC	No. of forced ejects (YCA)
NFYF	No.of forced ejects (YF/NSLT)
NHC	No. of H/SFI/D cuts
NJm	No. of Jm cuts
NJOI	No. of successful splicing
NJp	No. of Jp cuts
NLC	L cuts
NMC	No. of MC cuts
NMCM	No. clr.zero adjust miss
NMF	No. of MF/F-CLS cuts
NMLB	Bobbin supply errors
NMLC	Upper yarn lay-in cuts
NMLW	Lower yarn end finding miss
NMR	No. of MOIRE cuts
NMSL	Splicer misses
NMSM	Splice monitor cuts
NMSY	System errors
NMUP	Upper yarn end finding miss
NNC	N cuts
NO2	No. of other (2) cuts
NOCR	No. of OCR cuts
NOCW	No. of waiting for Spg.
NPAS	No. of CBF bypasses
NPBE	Bob eject no. of extracts
NPF	No. of PF/CLS/IPM cuts
NPP	No. of PP/P cuts
NSBE	No. of skinny bobbins
NSC	S cuts
NSMA	No. of mouth operations
NSPY	No. of supplied bobbins

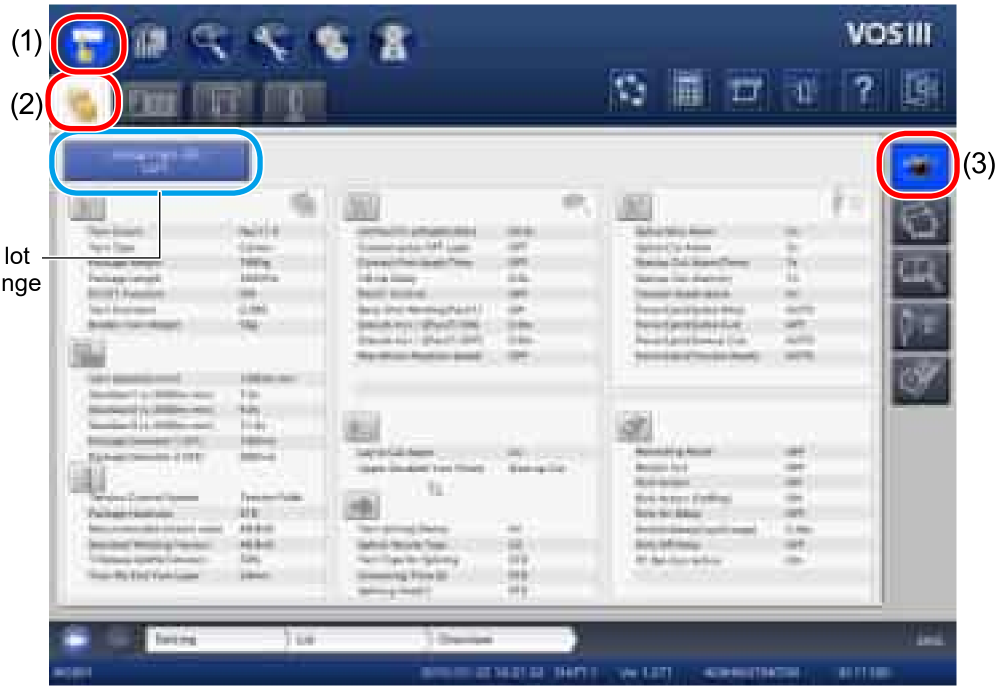
NT/T	CBF troubles/1000 bobbins
NTB	No. of tension breakages
NTC	T cuts
NYF	No. of yarn clearer cuts
O2/Y	Other (2) cuts per 100km
OCR/Y	No. of OCR defects/100 km
OSTM	Other down time [min]
PF/Y	PF/CLS/IPM cuts/100km
PP/Y	PP/P defects/100km
PRKG	Production amount [kg]
PRLB	Production amount [lb]
RNTM	Run time [min]
RTI%	Ratio of re-tie [%]
S1TM	Spg./Trouble time [min]
S2TM	Spg./Bobbin supply time [min]
S3TM	Spg./Spindle operation time [min]
S4TM	Spg./Doffing time [min]
S5T%	Spg/Winder wait time rate [%]
S5TM	Spg./Wait for wound bobbin [min]
SBE%	Skinny bobbin [%]
SC/Y	No. of S cut/100km

SCTM	Splice cycle time [min]
SEF%	Spindle efficiency [%]
SWTM	Splice wait unit down time [min]
SWTM1	CBF supply stop time [min]
SWTM2	Return C/V full time [min]
SWTM3	Feed C/V tray block time [min]
SWTM4	Tray level control time [min]
SWTM5	Sequen startup wait time [min]
SWTM6	Bobbin supply error time [min]
SWTM7	Other cause time [min]
TB/Y	Tension cut/100km
TC/Y	No. of T cut/100km
UOTM	Winding unit down time [min]
WND%	Full package ratio [%]
WNTM	Winding time [min]
WWT%	Spinning wait time rate (spare time) [%]
WWTM	Spinning wait time (spare time) [min]
YEF%	CBF yarn end find ratio [%]
YF/Y	Yarn defects/100km
Y-SPEED	Yarn speed [m/min]

Sec 3 Settings screens

<11100> Lot overview

You can check a summary of the lot settings.



Touch “Switch lot display” to change the lot display.

<11210> Package (production) basic settings

You can perform basic settings for package production for each lot. In addition, you can also create a new lot and change the lot name.

<11220> Drum drive

You can perform all settings for the winding unit's winding drum for each lot.

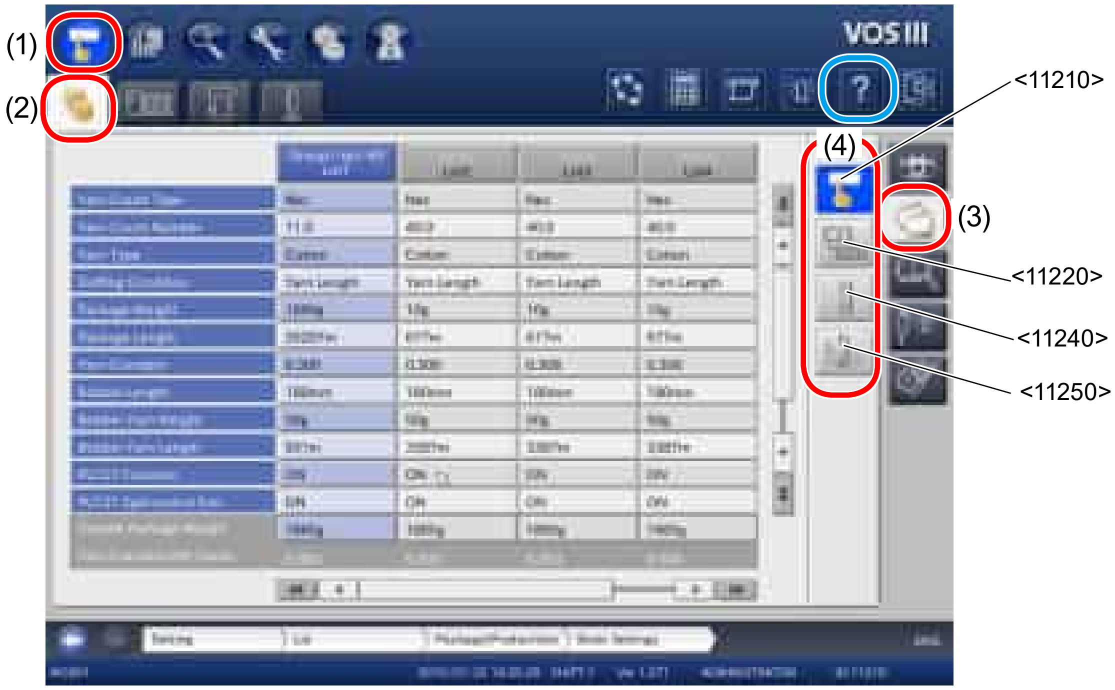
<11240> Tension

You can perform all settings for the winding tension for each lot.

<11250> Tension manager

You can perform all settings for the tension manger for each lot.

- **After touching (1), (2) and then (3) in order, touch and select one of the icons from (4).**



* You can check the explanation for each item by touching the help icon.

<11310> Package (quality) basic settings

You can perform basic settings for package quality for each lot.

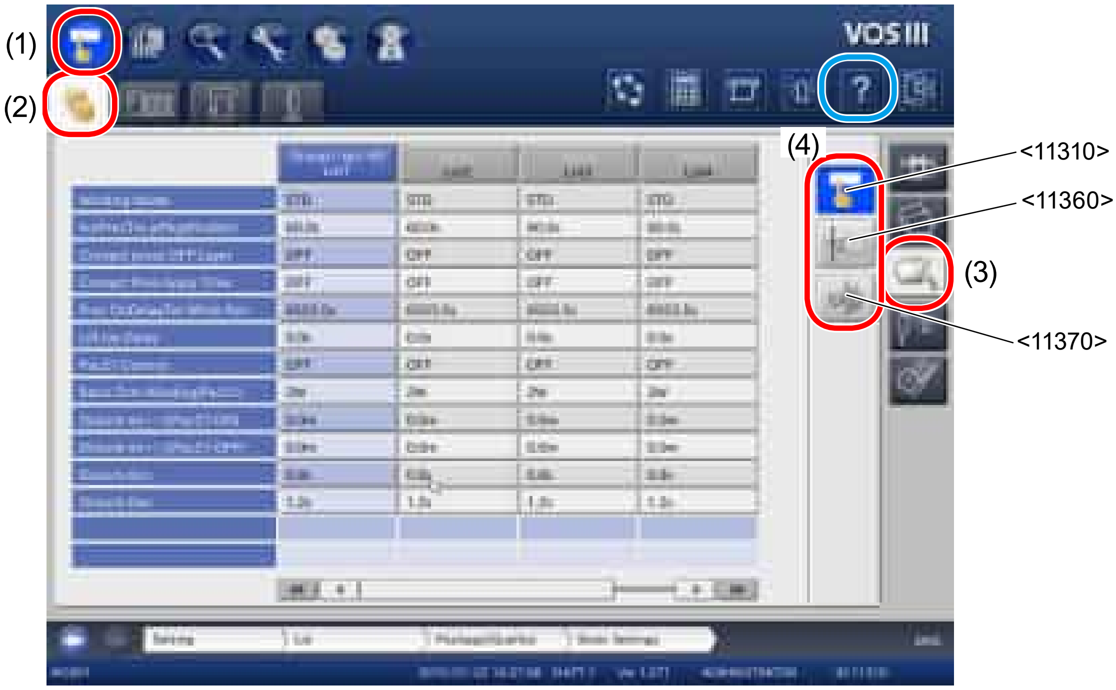
<11360> Clearer

You can perform all settings for the clearer for each lot.

<11370> Splicer

You can perform all settings for the splicer for each lot.

- **After touching (1), (2) and then (3) in order, touch and select one of the icons from (4).**



* You can check the explanation for each item by touching the help icon.

<11410> Unit alarm basic settings

You can perform basic settings for the winding unit’s alarms for each lot.

<11460> Unit alarm lower yarn suction

You can perform the lower yarn suction (removal) settings for the winding unit’s alarms for each lot.

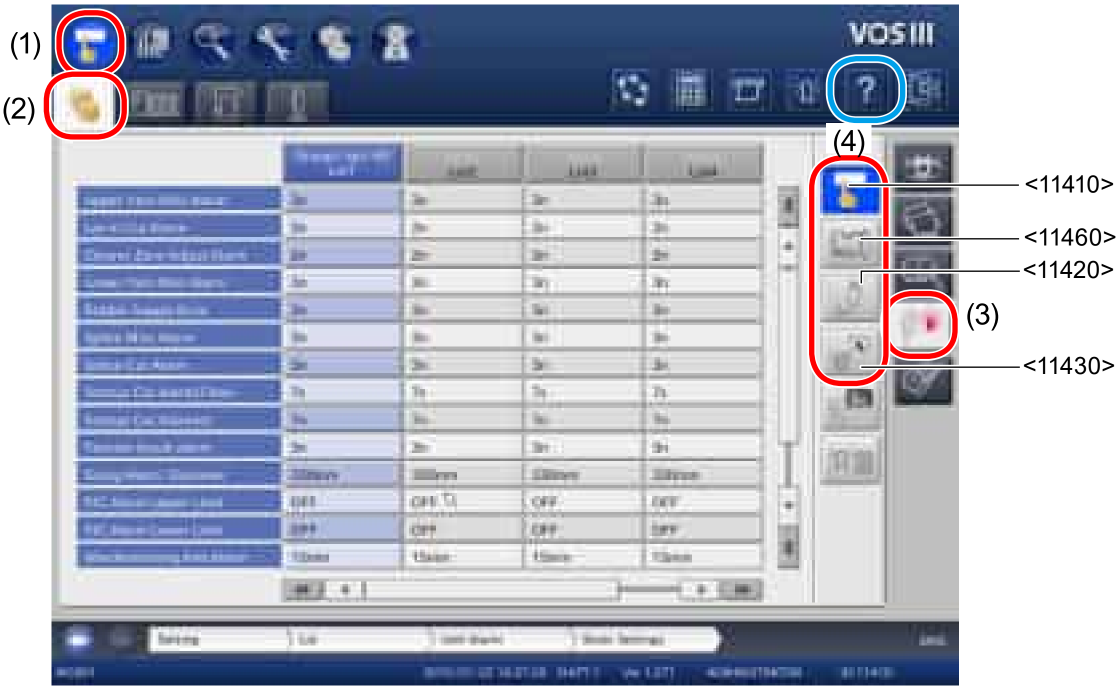
<11420> Unit alarm forced ejection settings

You can perform forced ejection settings for the winding unit’s alarms for each lot.

<11430> Unit alarm details settings

You can perform all settings for the winding unit’s alarms for each lot.

- **After touching (1), (2) and then (3) in order, touch and select one of the icons from (4).**



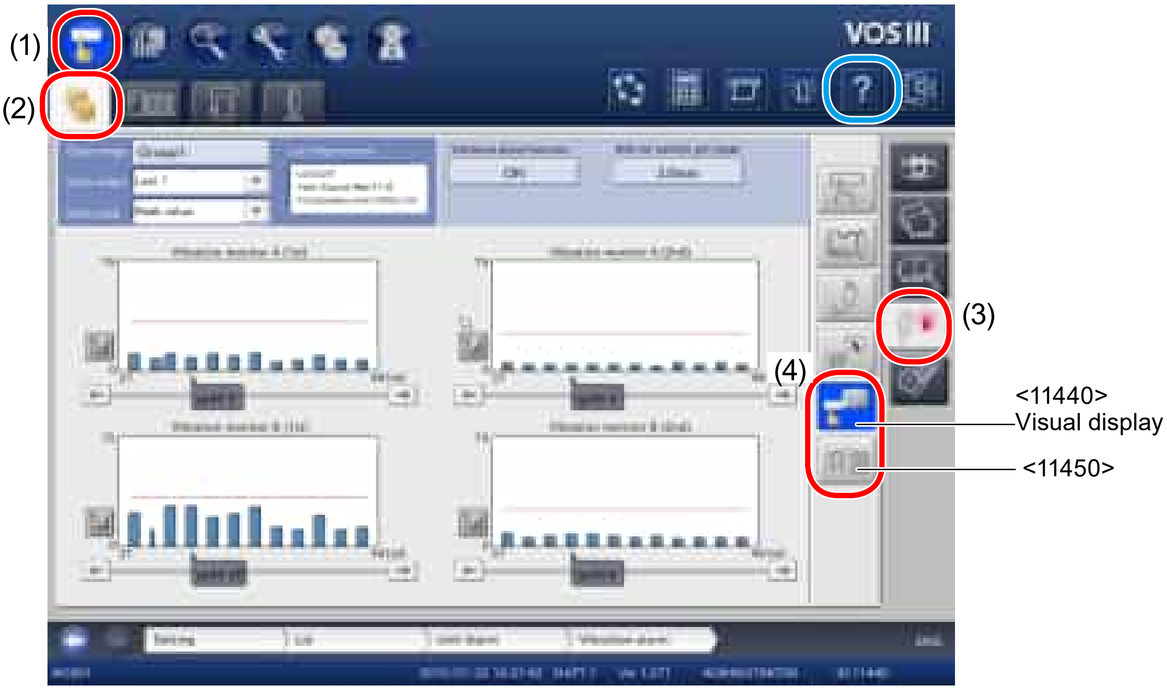
* You can check the explanation for each item by touching the help icon.

<11440> Vibration alarm settings (visual display)

<11450> Vibration alarm settings

You can perform vibration alarm settings for the winding unit's alarms for each lot.
There are two channels for the vibration alarm settings: A and B. Each has a winding start range (1st) and a stability range (2nd).

- **After touching (1), (2) and then (3) in order, touch and select one of the icons from (4).**



* You can check the explanation for each item by touching the help icon.

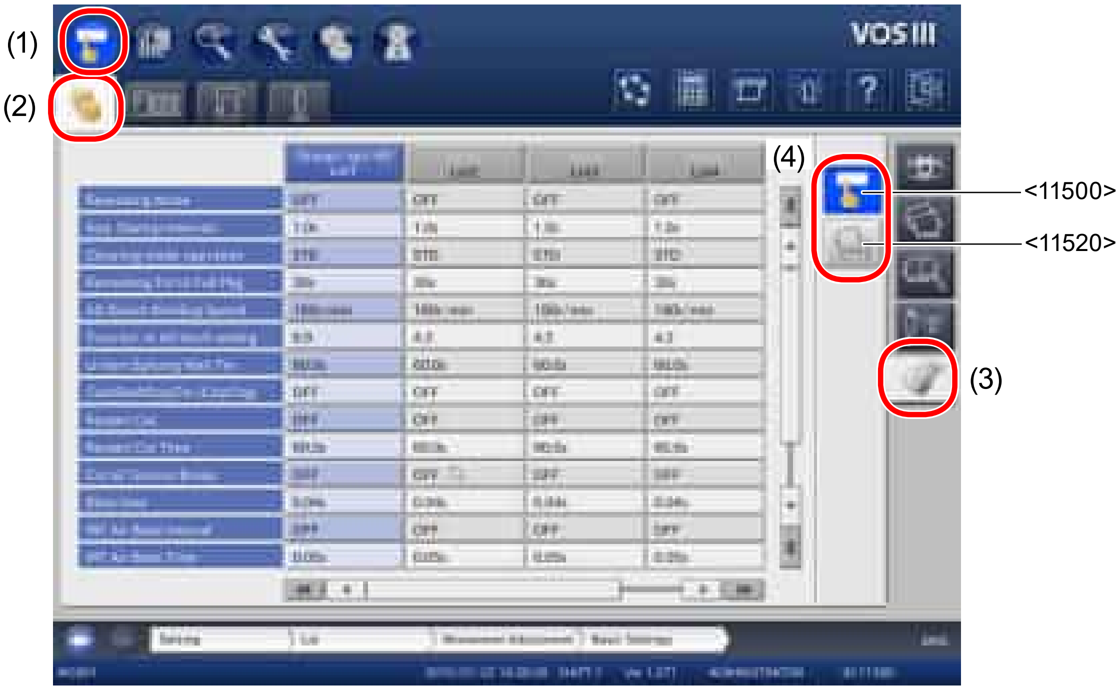
<11500> Winding unit operation adjustment

You can adjust and set each device inside the winding unit for each lot.

<11520> Suction mouth operation adjustment

You can perform adjustment settings for suction mouth operation for each lot.

- **After touching (1), (2) and then (3) in order, touch and select one of the icons from (4).**



* You can check the explanation for each item by touching the help icon.

<12100> Main machine basic settings

You can set the machine’s operations.

<12200> Air suction

You can perform all settings for the static pressure on the blower, blow cleaner and dust collector.

<12300> Package conveyor

You can perform all settings for the package conveyor.

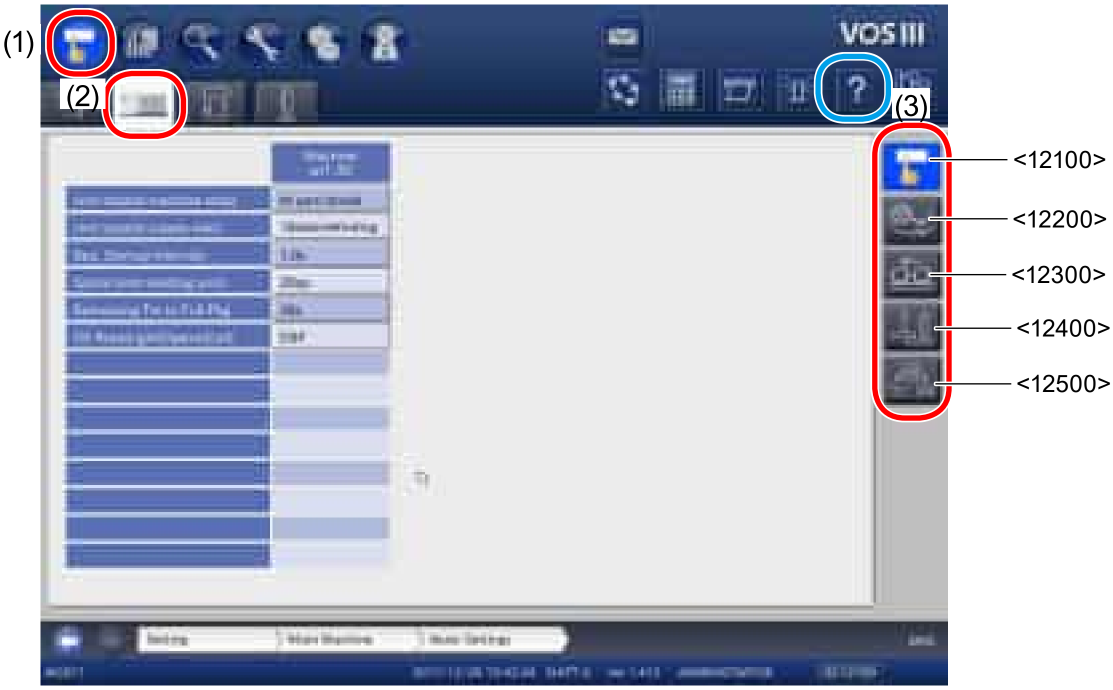
<12400> Bobbin conveyance

You can perform all settings for the bobbin conveyance.

<12500> Spinning machine data link

You can perform all settings for the spinning machine data link.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**



* You can check the explanation for each item by touching the help icon.

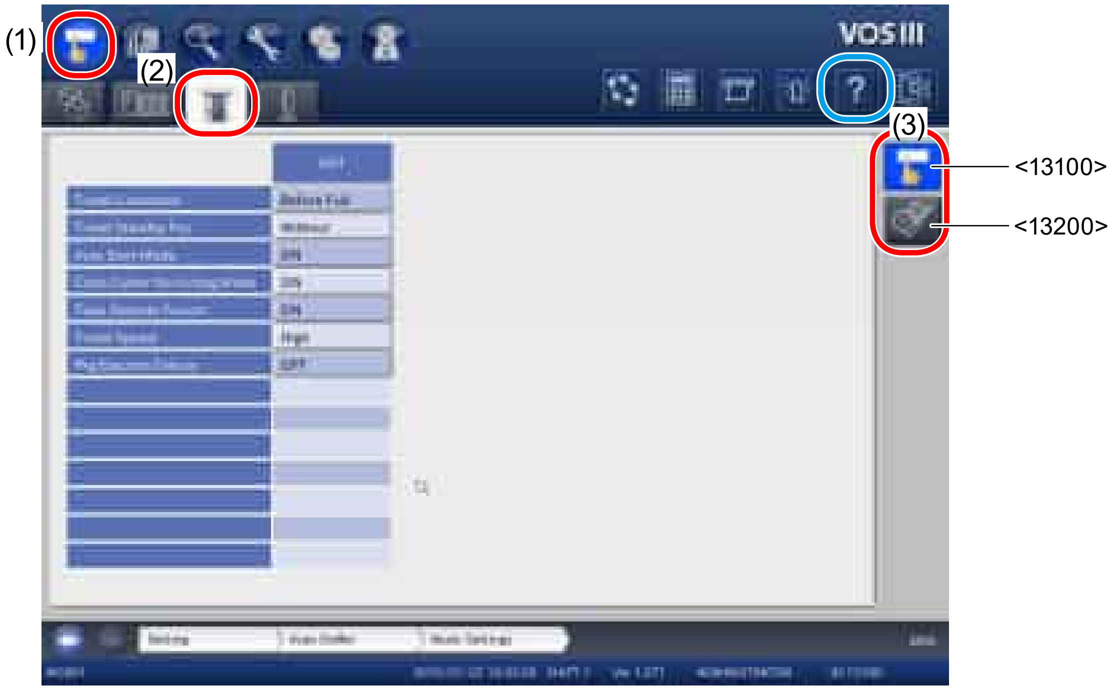
<13100> AD basic settings

You can perform basic settings for AD.

<13200> AD operation adjustment

You can perform adjustment settings for AD operations.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**



* You can check the explanation for each item by touching the help icon.

<14100> CBF basic settings

You can perform basic settings for CBF.

<14200> Yarn end finder

You can perform all settings for the yarn end finder.

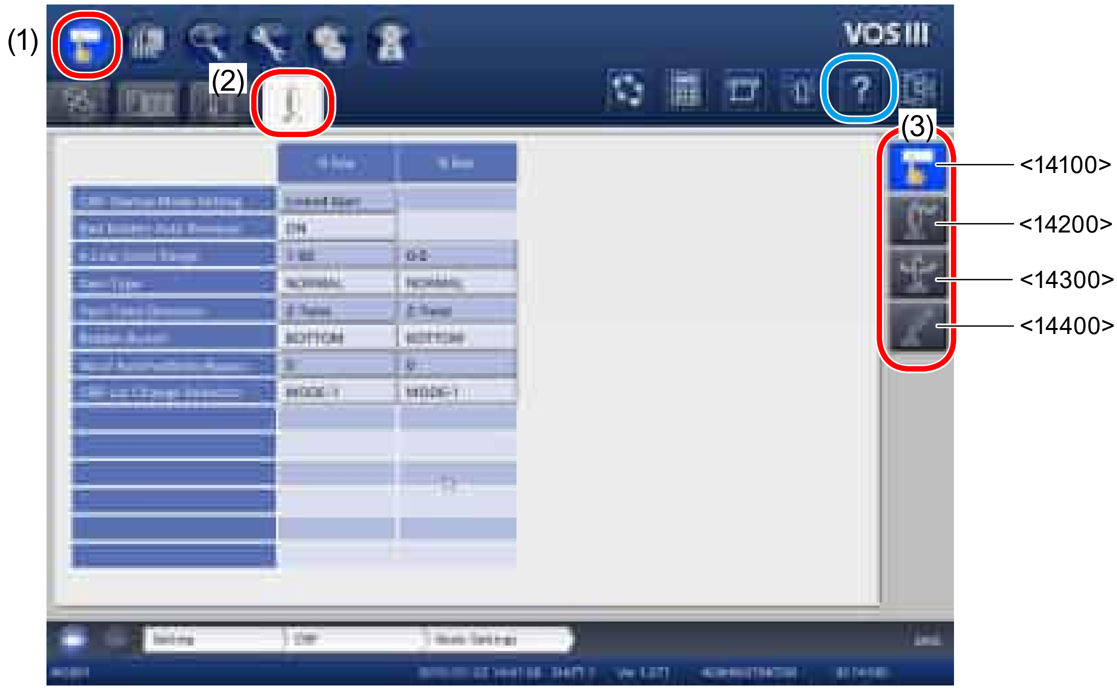
<14300> Bobbin stripper

You can perform all settings for the bobbin stripper.

<14400> Bobbin ejector

You can perform all settings for the bobbin ejector.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**

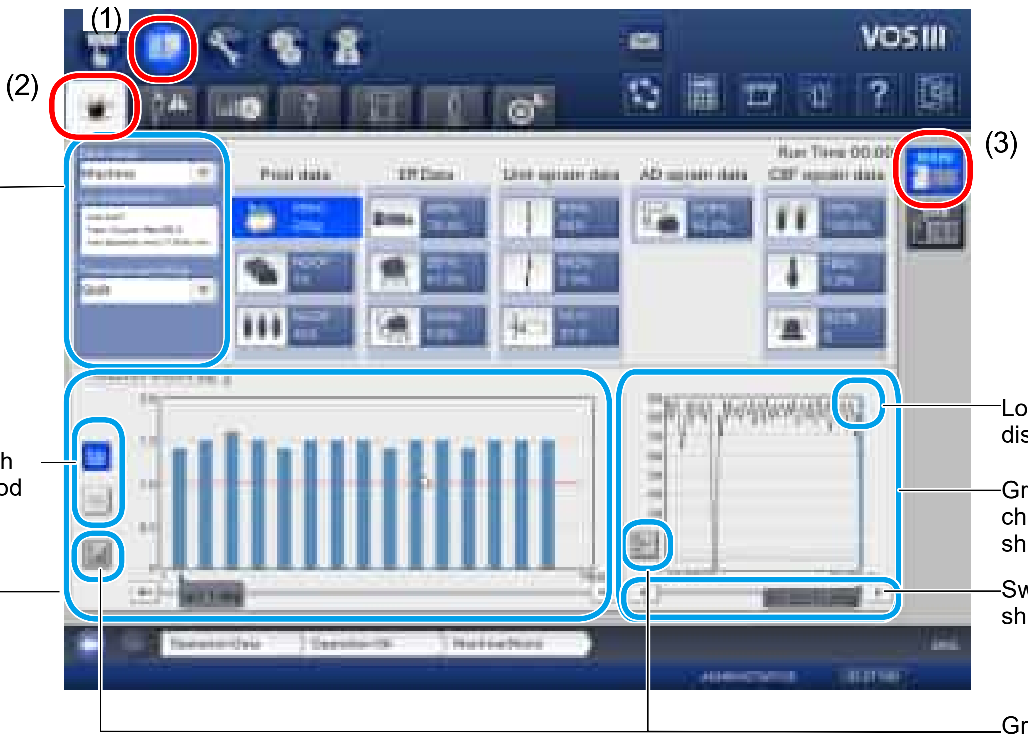


* You can check the explanation for each item by touching the help icon.

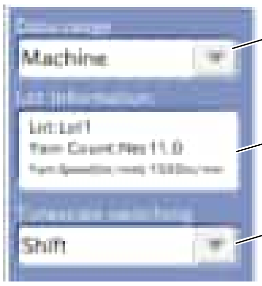
Sec 4 Operation monitoring screens

<21100> Machine operation data OA (main)

An overview of the operation data is displayed.


(1)
(2)
(3)
VOS III
Print data
Eff Data
Unit splice data
AD splice data
CBF splice data
Switch data unit
Change graph display method Replaced
Operation data graph display
Lot change point display
Graph to check changes per shift
Switch display shift/hour
Graph options/ target settings

Switch data unit


Machine
Lot:Lot1
Yarn Count:Nec11.0
Shift

Data range
- * Switch to the following unit data
  Machine/Winding unit/Group

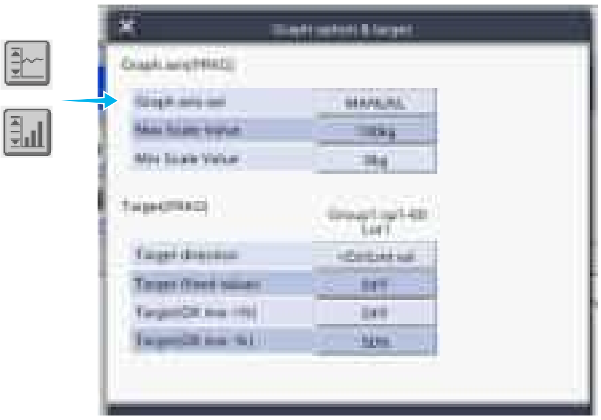
Lot information
- * Displays information about the lot name, yarn count and yarn speed for the selected unit

Switch time scale
- * Switch to the following unit data
  Shifts/hours (or spinning doffs)/past 3 shifts/past 3 hours (or past 3 spinning doffs)/test shifts

* Refer to the “Test shift” section mentioned later on how to use the test shift.

Graph options/ target settings

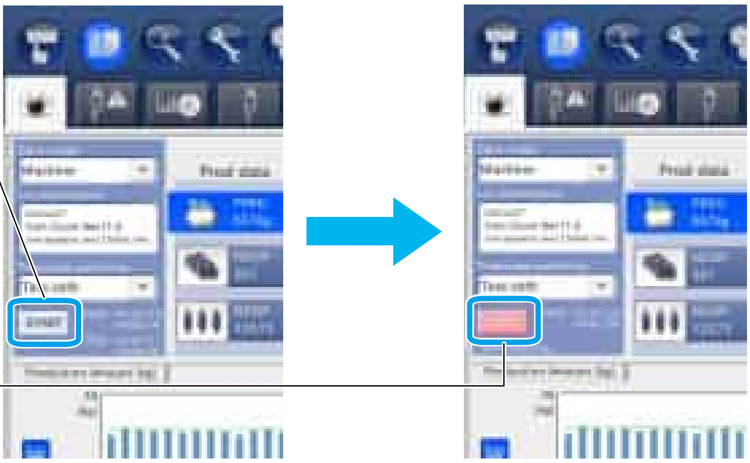
- The graph axis scale can be automatically or manually set.
  The maximum and minimum scale on the graph can be changed when using the manual settings.
- You can set the target items in the display.



Test shift

You can select and use the test shift when switching the data unit.
You can collect data for a certain time period, which is different or separate from the normal shift. The screen displays the data from the test shift.

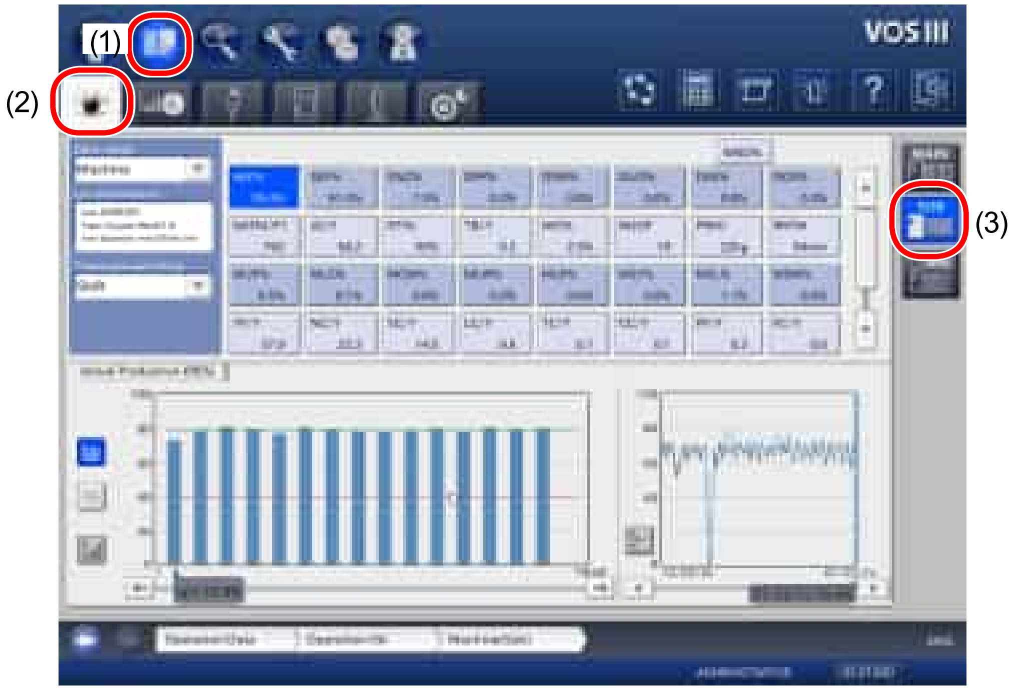
1. **Touch “Test Shift Start.”**
2. **To stop the operation, touch “Test Shift Stop.”**



* When setting the timer, the shift will automatically stop after the test shift starts and the set time expires. Refer to Section 7, “<65300> Test shift” for details on the timer settings.

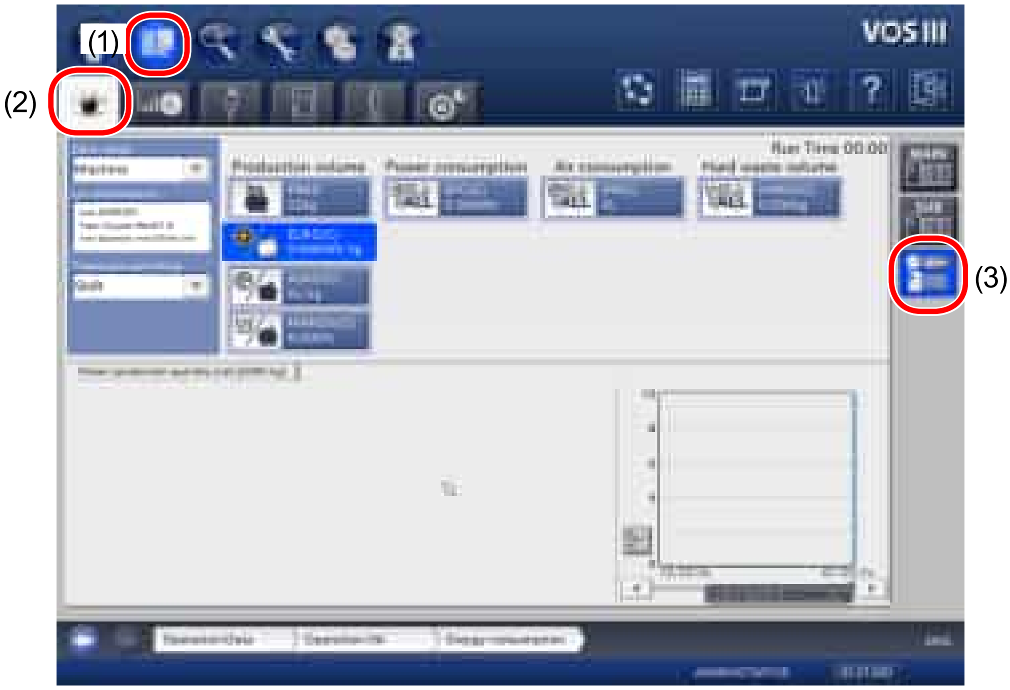
<21200> Machine operation data OA (sub)

Detailed machine operation data is displayed.



<21300>   Machine operation data OA (energy consumption)

Displays machine energy consumption data.


(1)
(2)
(3)
VOS III
Production volume
Power consumption
Air consumption
Run Time 00:00

<23100> Spindle efficiency

The machine efficiency is analyzed from all operation data.
You can check improvement locations from the breakdown of the overall machine efficiency data.

<23200> Unit alarm stop cause

The stop cause (DAS%) from the unit alarm is analyzed.
You can check improvement locations from the breakdown of the unit alarms shown in order of frequency.

<23700> Splicing wait stop cause

Analyzes unit splicing wait stop causes (DSW%).
Improvement locations can be checked from breakdowns of splicing wait stop data.

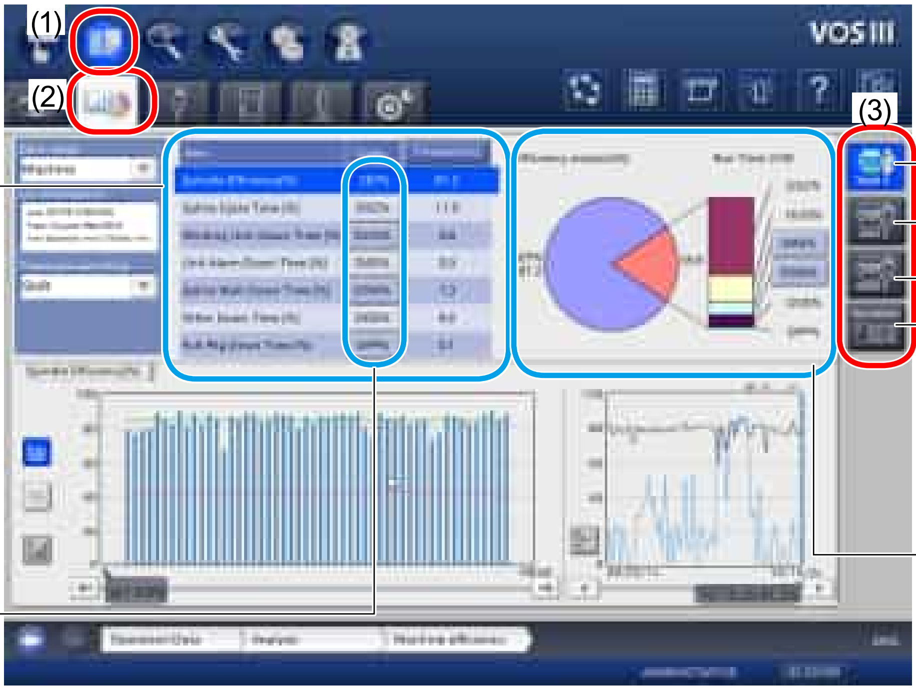
<23600> Simulation of number of winding units

Simulates optimal No. of winding units per spinning machine production capacity based on past operation data.

<23620> Production quantity prediction

The simulated production quantities for operation condition changes can be checked based on past operation data.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**



List of details

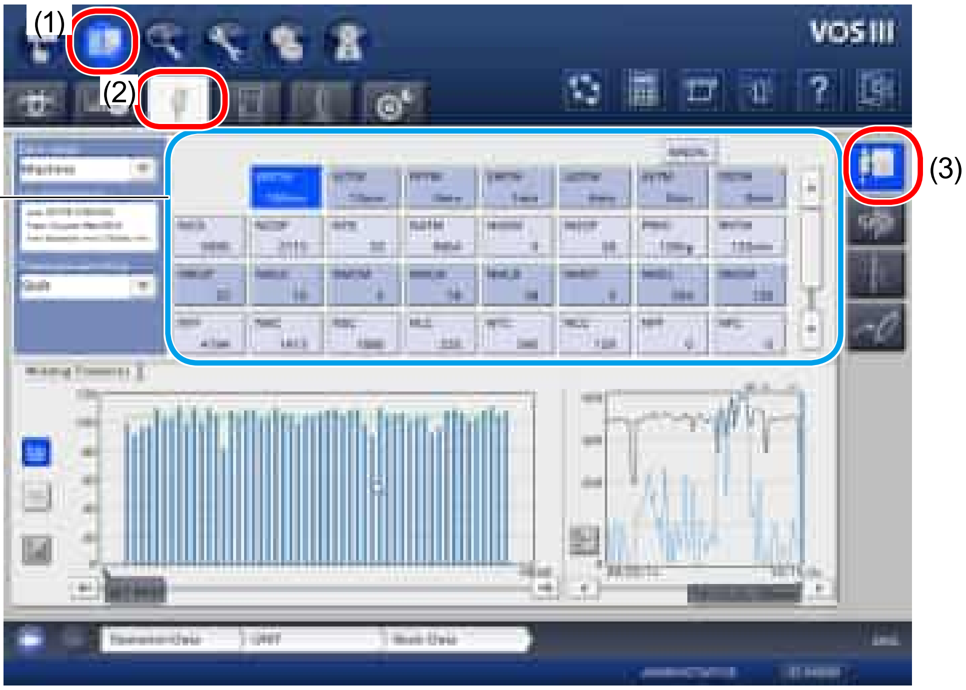
<23100>
<23200>
<23700>
<23600>

Pie or bar graph display for efficiency breakdown

A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<24000> Unit basic data

Detailed operation data is displayed for the winding unit.



A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<23300> Unit splicing error cause

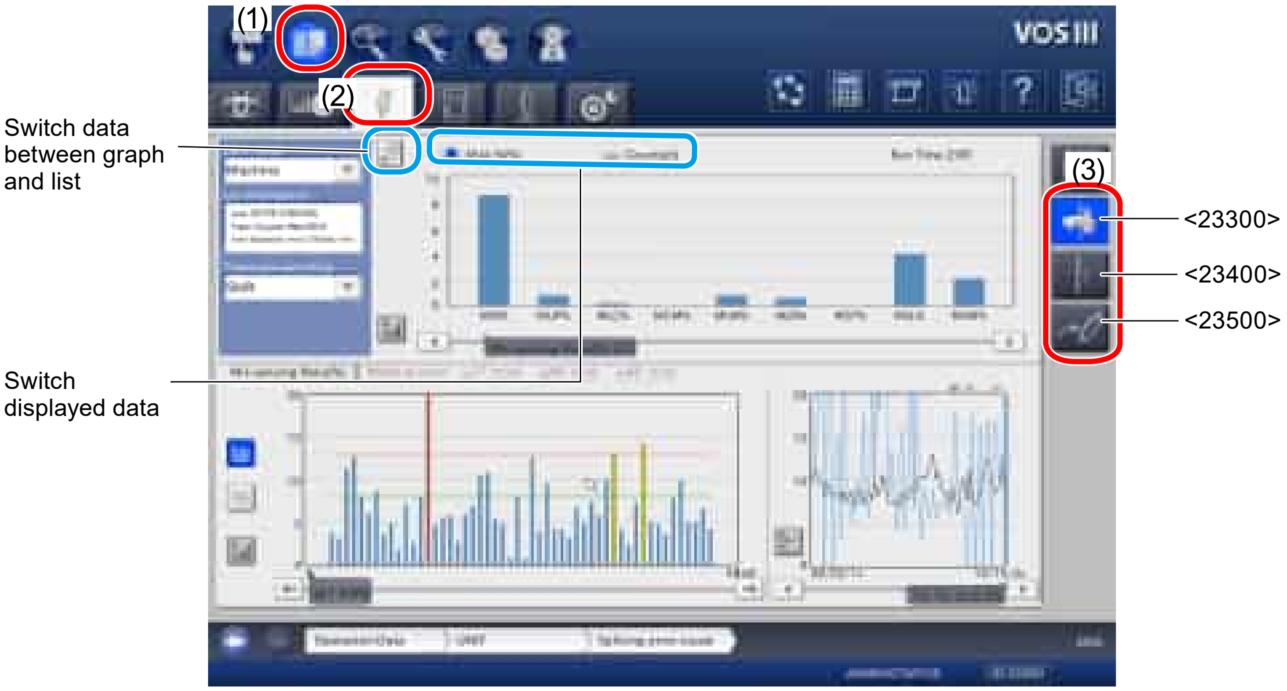
The cause for the splicing error is analyzed.
You can check improvement locations from the breakdown of the splicing error data.

<23400> Unit yarn breakage cause

The cause for the yarn breakage error is analyzed.
You can check improvement locations from the breakdown of the yarn breakage error data.

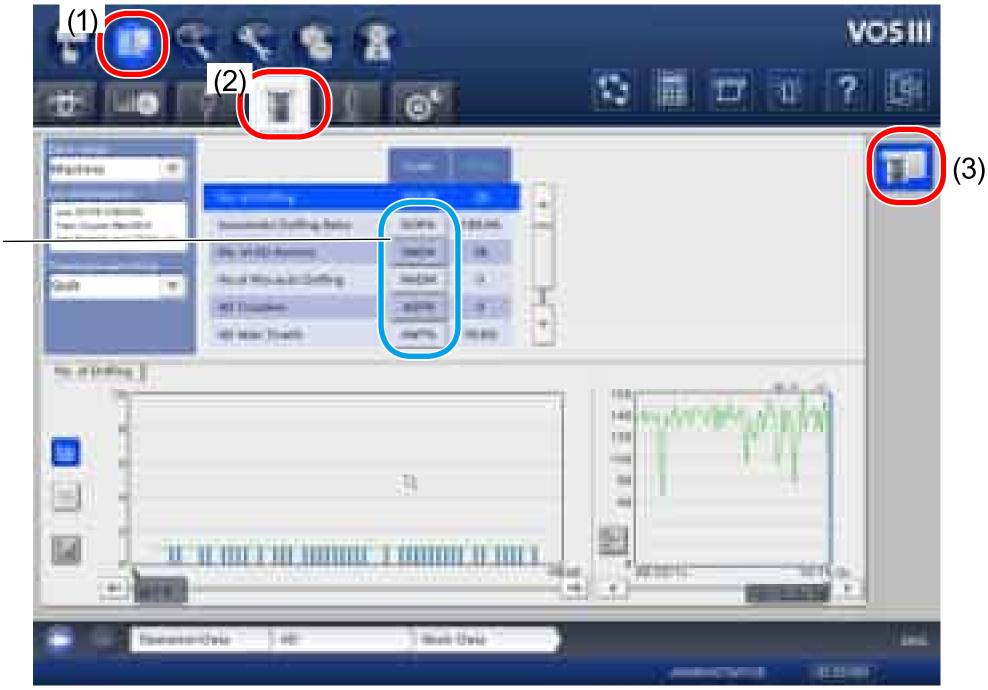
<23500> Unit forced ejection cause

The cause for winding units forced ejection is analyzed.
You can check improvement locations from the breakdown of the forced ejection data.


(1)
(2)
(3)
VOS III
Switch data between graph and list
Switch displayed data
<23300>
<23400>
<23500>

<25100> AD basic data

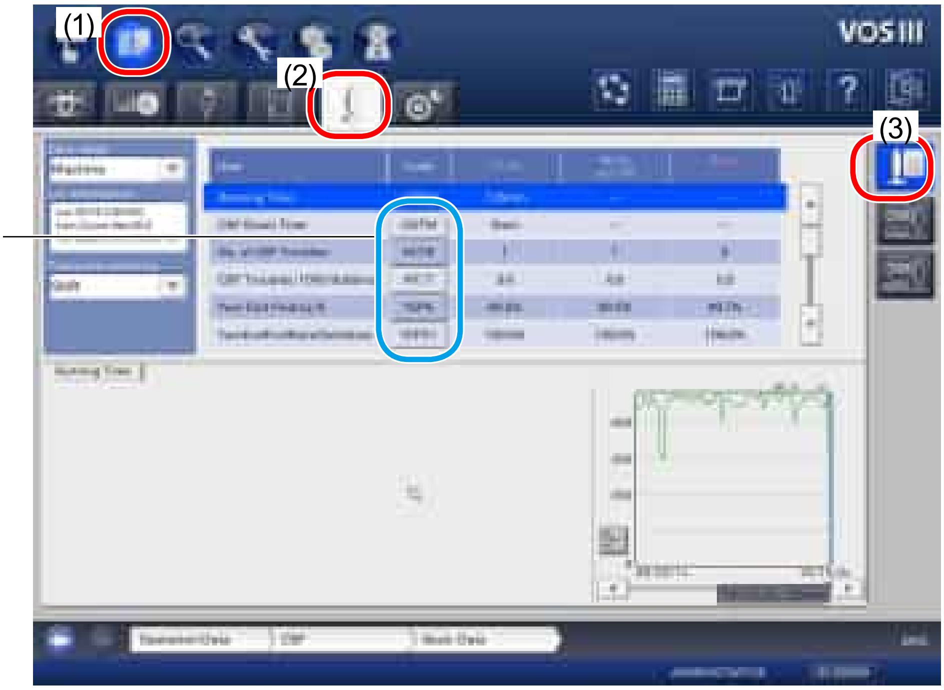
Detailed operation data is displayed for AD.



A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<26000> CBF basic data

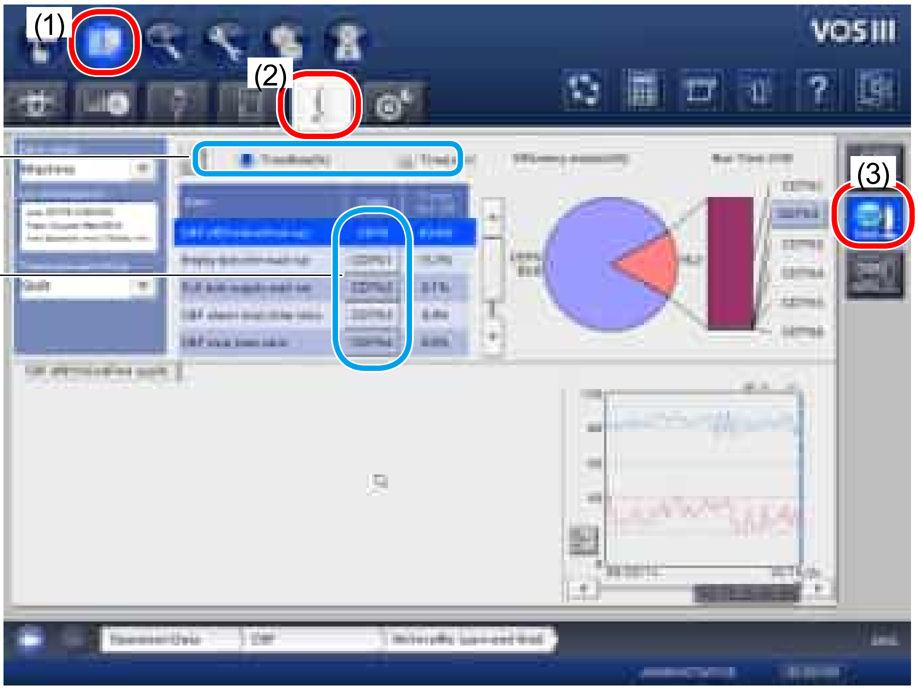
Detailed operation data is displayed for CBF.



A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<26100> CBF machine efficiency (yarn end finding operation)

Analyzes CBF machine efficiency (yarn end finding operation).

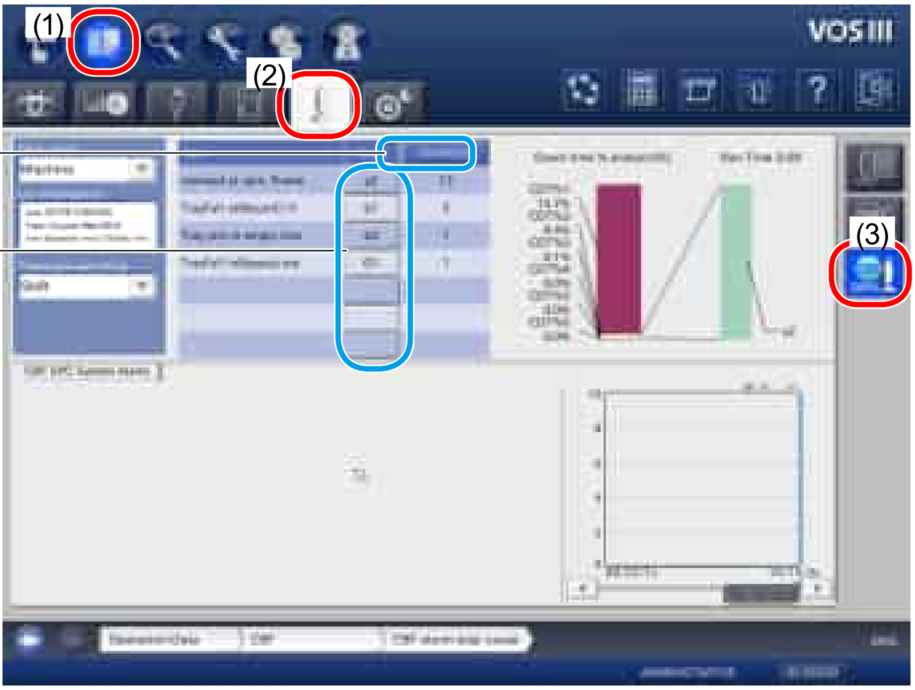


Switch displayed data

A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<26200> CBF alarm stop cause

Analyzes CBF alarm stop causes (CDT%3).

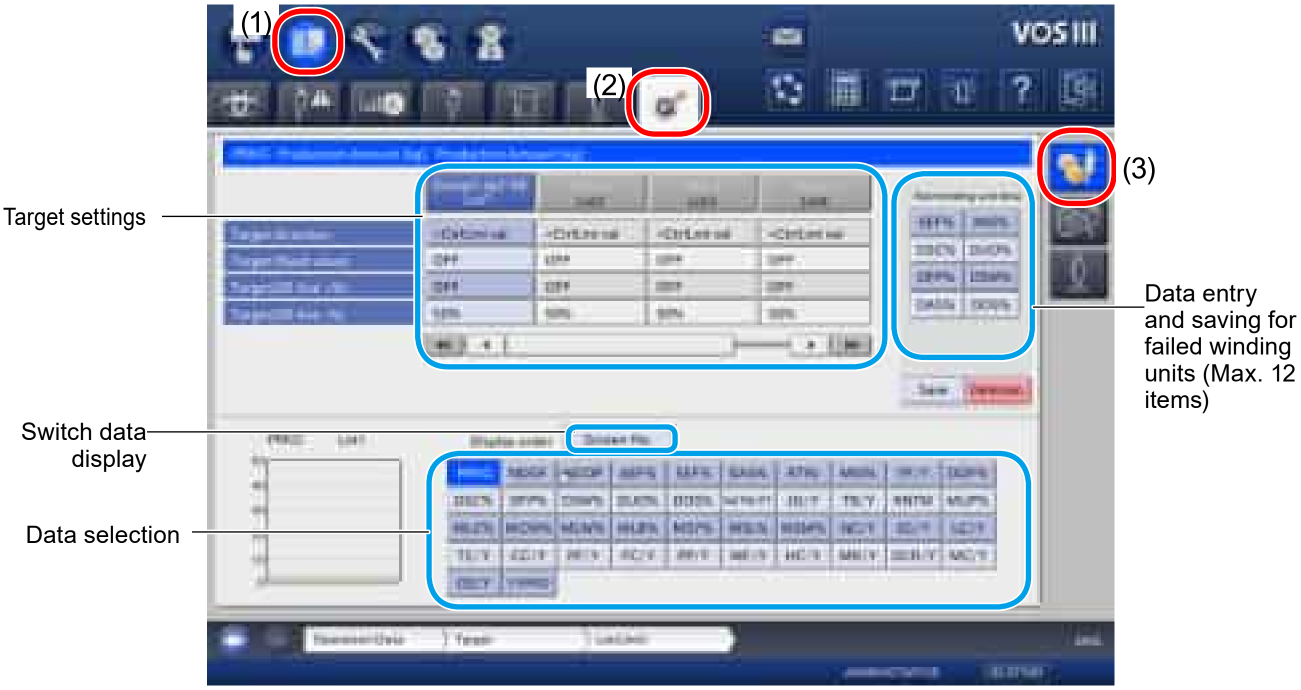


Switch displayed data

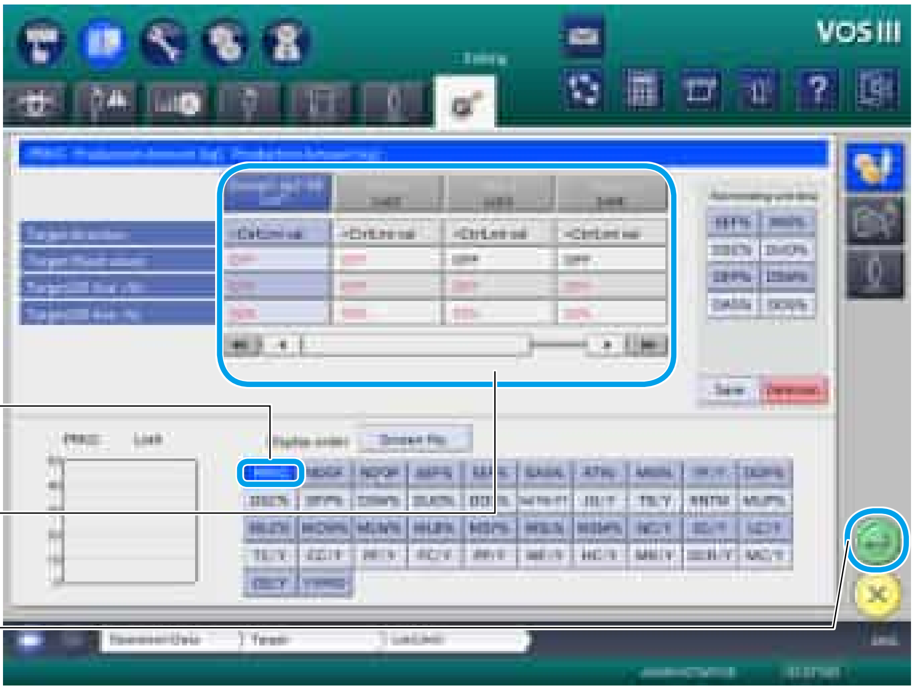
A detailed graph for the corresponding data is displayed at the bottom of the screen by touching the code.

<27100> Target

The data targets for all operation data can be set for each lot.

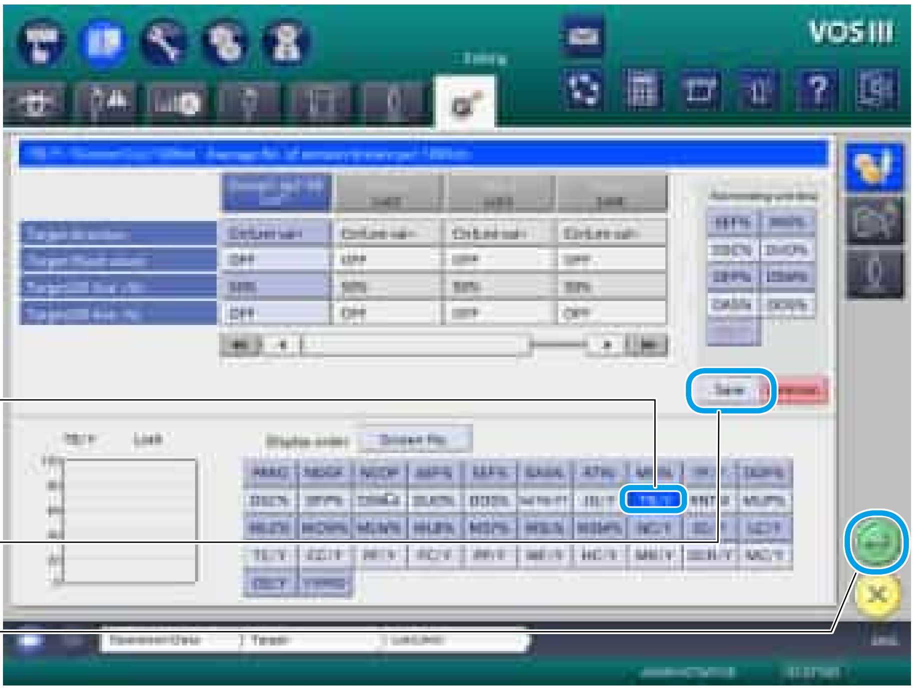

(1)
(2)
(3)
VOS III
Target settings
Switch data display
Data selection
Data entry and saving for failed winding units (Max. 12 items)

Target settings



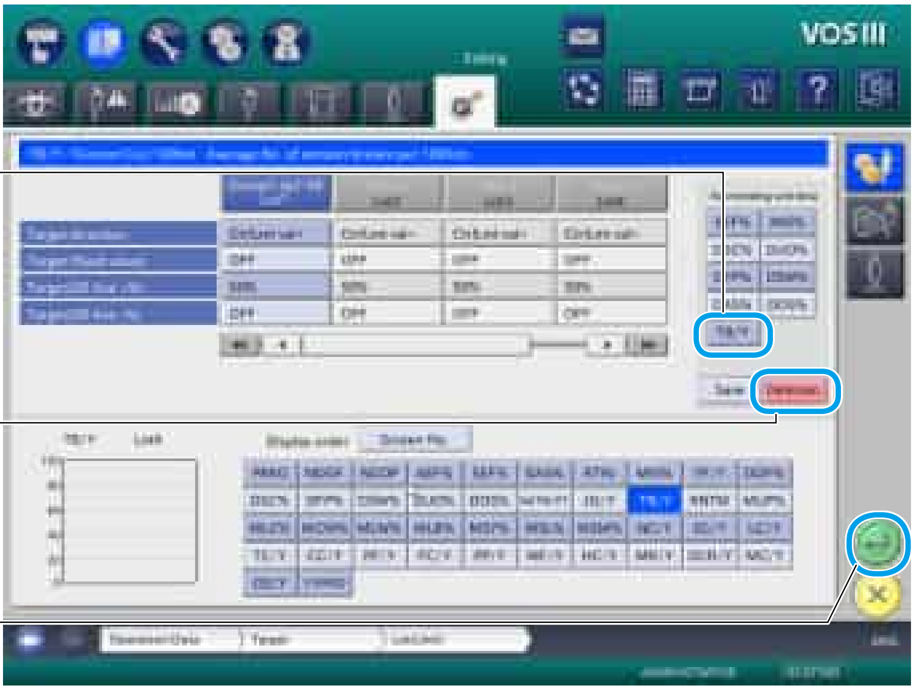
1. Touch the target you want to set.
2. Set the target for each lot.
3. Touch “Confirm.”

Data entry and saving for failed winding units



1. Touch the data you want to enter and save.
2. Touch “Data Save.”
3. Touch “Confirm.”

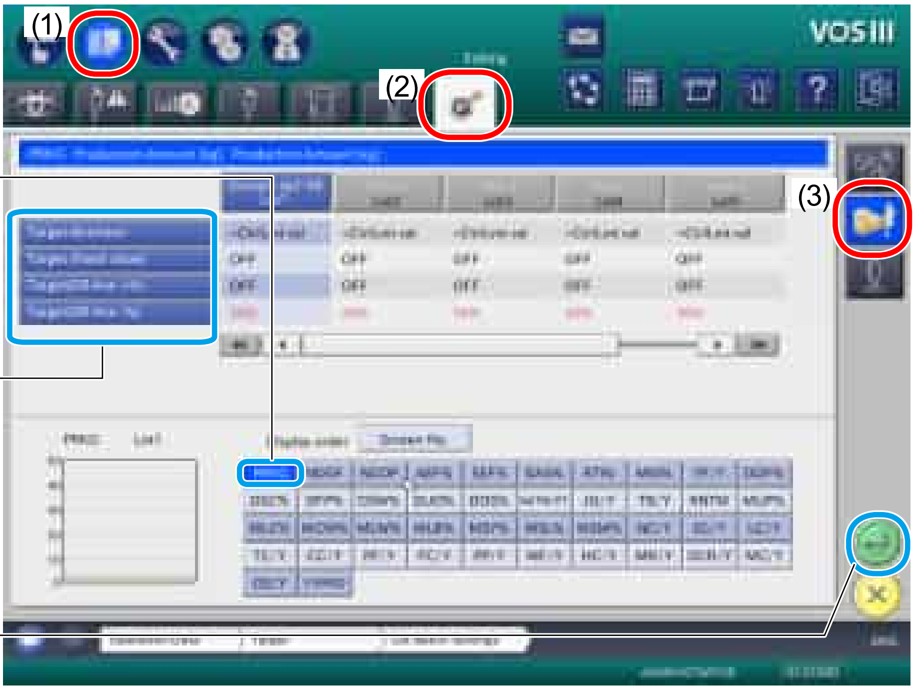
Data deletion for failed winding units



1. **Touch the data you want to enter and delete.**
2. **Touch “Deletion.”**
3. **Touch “Confirm.”**

<27200> Target batch settings

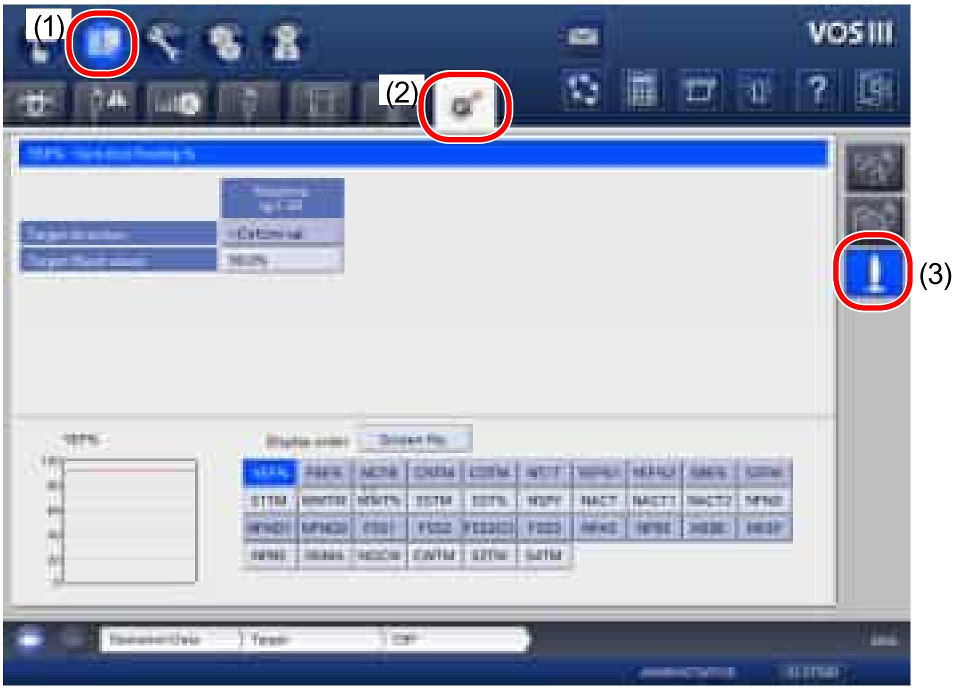
The targets for all operation data can be set in one batch for all lots.



1. **Touch the target you want to set.**
2. **Touch the “Batch setting” and set the targets.**
3. **Touch “Confirm.”**

<27300> Target CBF settings

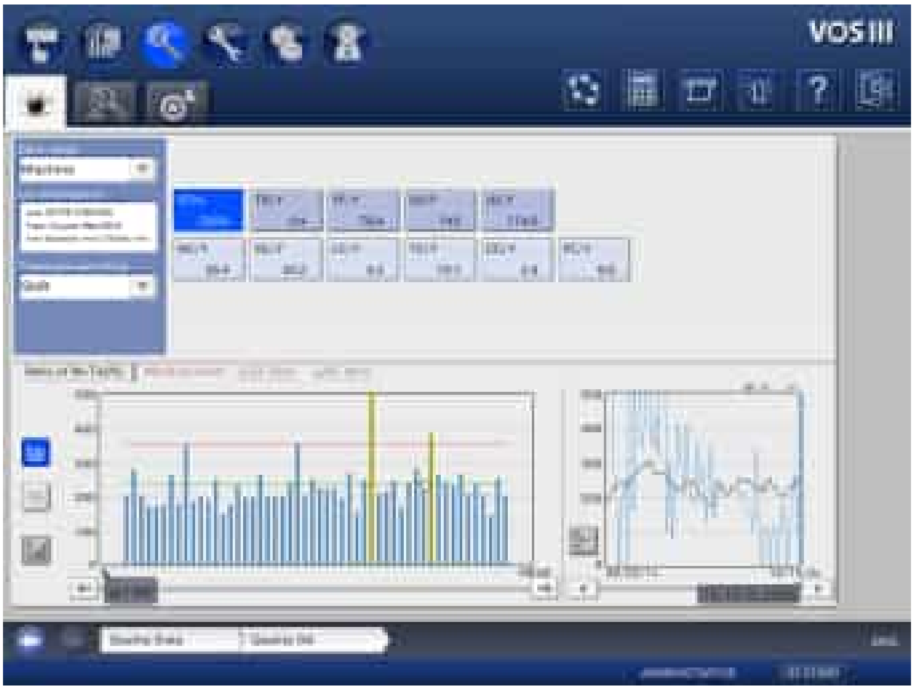
The data targets for the CBF operation data can be set individually.



Sec 5 Quality screens

<31000> Quality OA

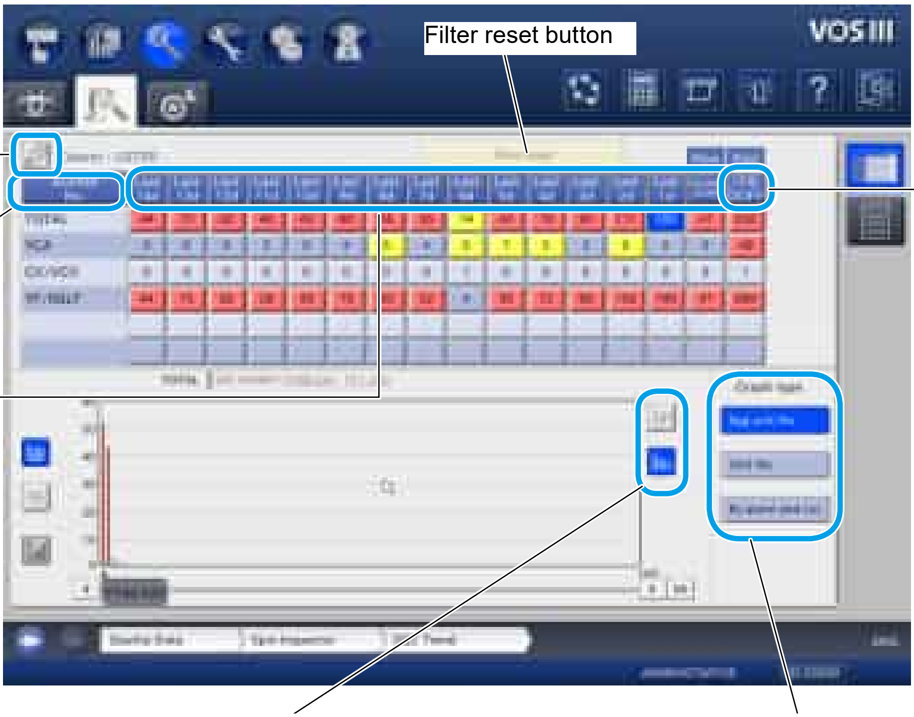
The code, for the data that is closely tied with yarn quality, is displayed.



<33200> SQC (Spinner Quality Control) trends

Displays a matrix of the occurrence frequency of the No. of defective bobbin alarms and cut data which occurred per each spinning doff. The data display colors for the matrix can be changed using the target settings.

* This screen displays when using a spin inspector specification.



Filter reset button

Switch between displaying or hiding graph

Display data selection

The order can be sorted by highest No. of alarm occurrences during spinning doff by touching the spinning doff button.

The total No. of spinning doffs for No. of alarm occurrences can be changed by pushing and holding the [**] DOFF button.

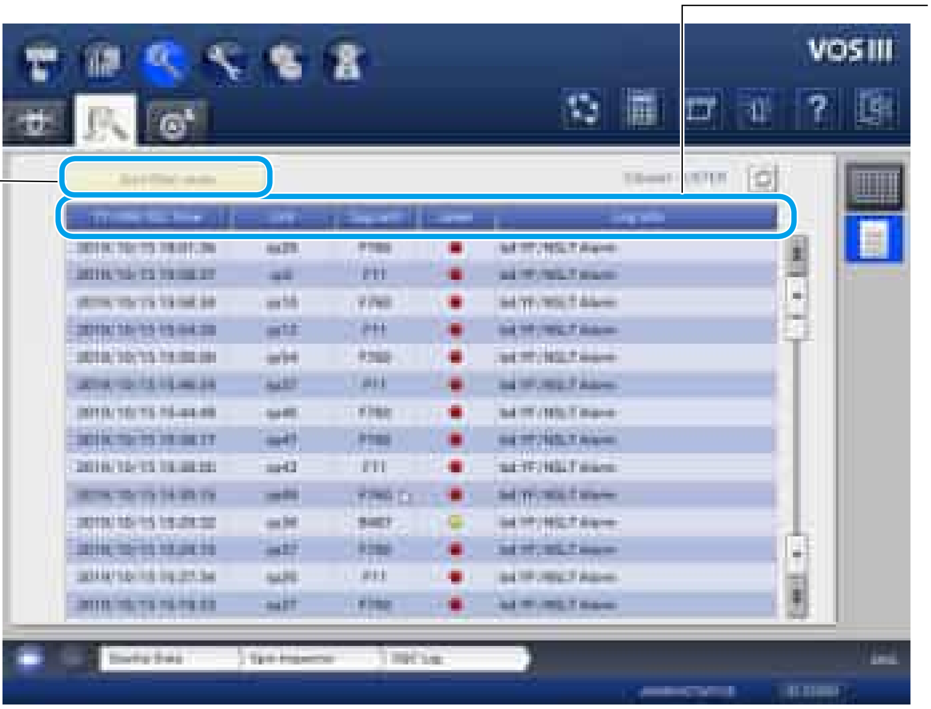
The graph display settings can be changed to descending order or the winding unit number order.

The graph can be changed to a spinning unit number based graph, a winding unit based graph or an alarm based graph.

<33300> SQC (Spinner Quality Control) log

The alarm history for the defective bobbins, which are set to be removed, is displayed in chronological order. Spinning unit numbers that have been subject to multiple alarms can be color coded for easy identification.

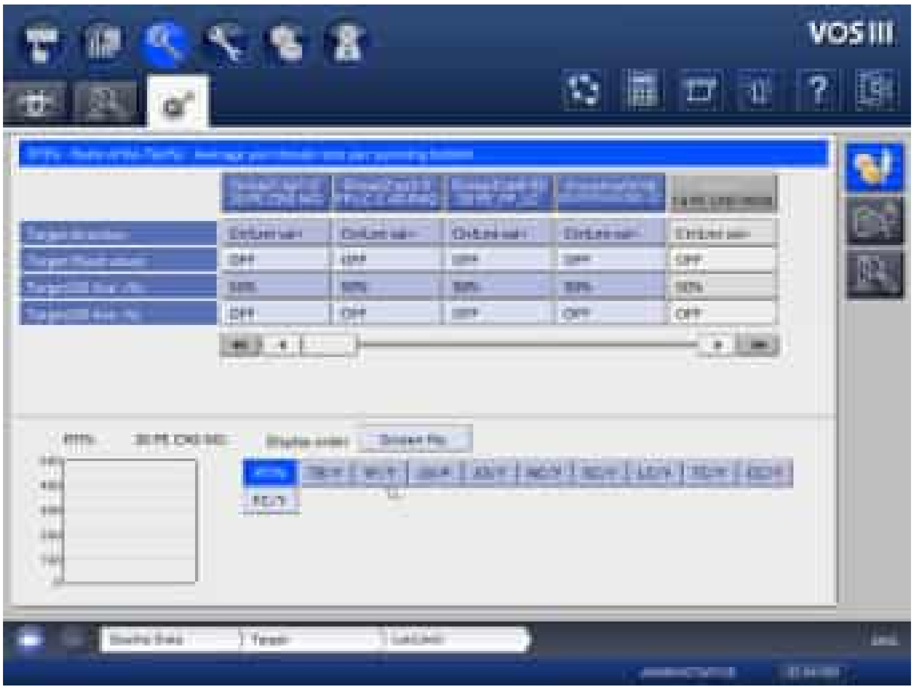
* This screen displays when using a spin inspector specification.



* The display order for each data type can be changed using the date/time, unit No., spinning unit No., alarm level, or alarm information sort buttons.

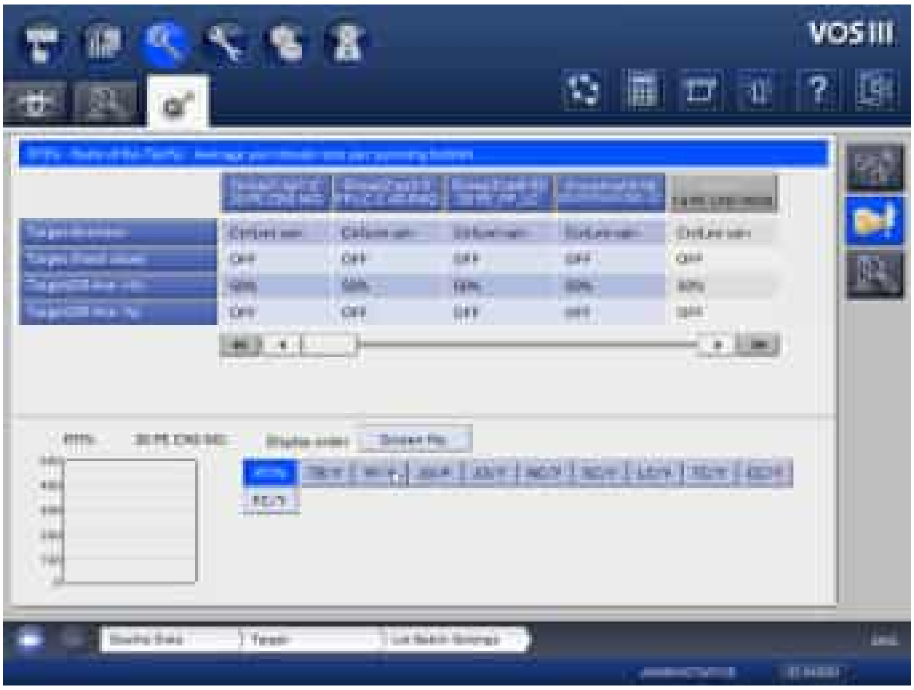
<34100> Target lot

The data targets for all quality related data can be set for each group.
Refer to Section 7 “<27100> Target settings,” for more details on the setting method.



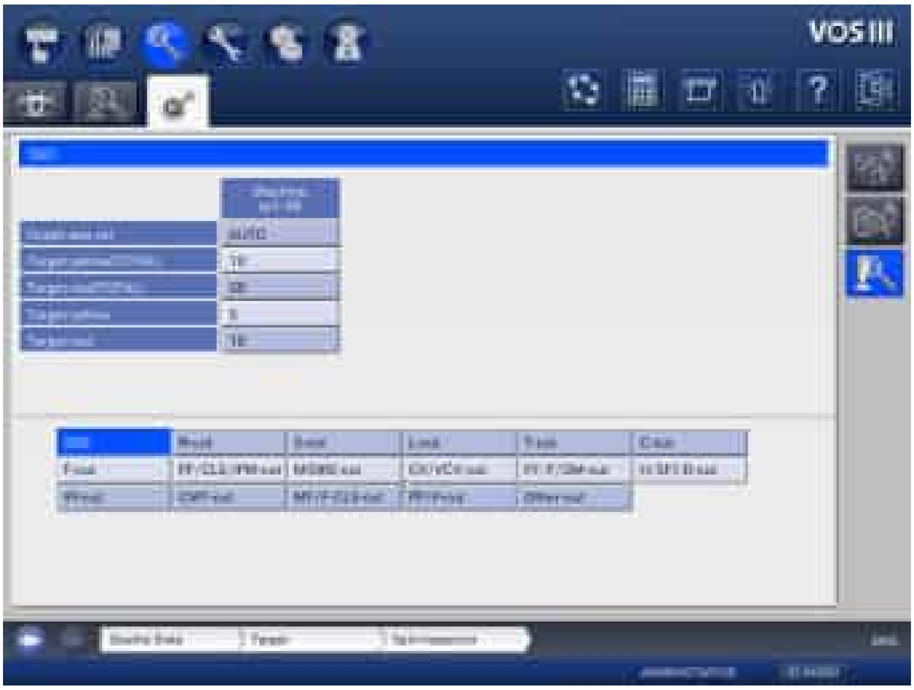
<34200> Target lot batch

The data targets for all quality related data can be set in one batch for all lots.
Refer to Section 7 “<27200> Target batch settings,” for more details on the setting method.



<34300> Target spin inspector

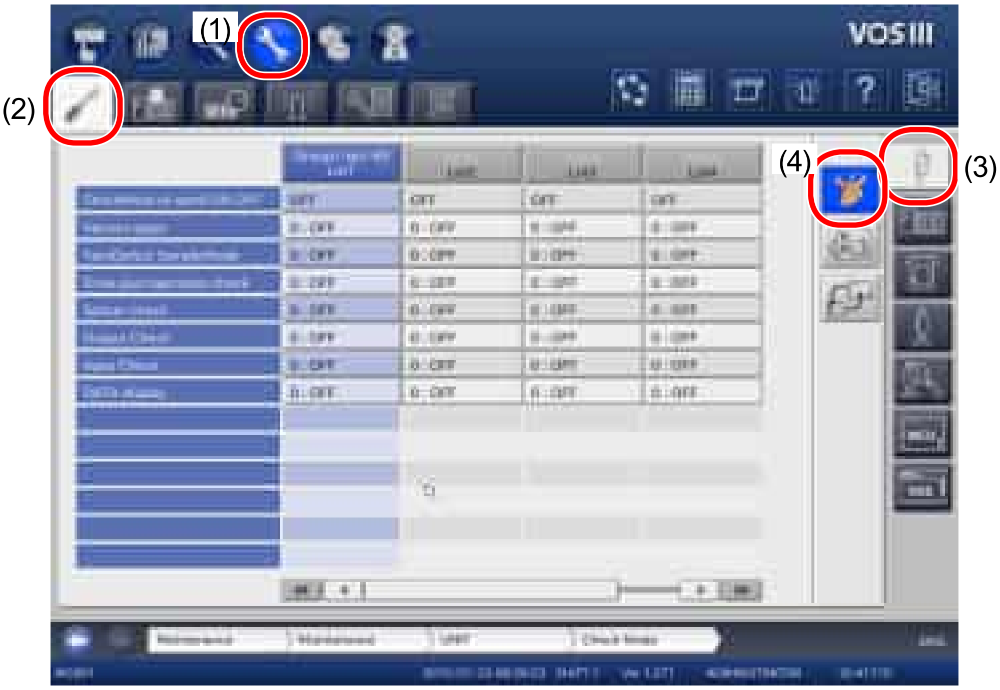
The scale for the target and graph can be changed on the SQC trends and SQC log screens.
* This screen displays when using a spin inspector specification.



Sec 6 Maintenance screens

<41110> Unit check mode

All check mode settings can be performed for the winding unit.
The check mode for the winding unit can be set and used with each unit or with each group.
For details, refer to Section 3.



<41170> Unit SPC replacement

When replacing the unit SPC, the fixed yarn length and all correction data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the SPC.

<41220> Main SPC replacement

When replacing the main SPC, all data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the SPC.

<41320> AD SPC replacement

When replacing the AD SPC, all data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the SPC.

<41420> CBF SPC replacement

When replacing the CBF SPC, all data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the SPC.

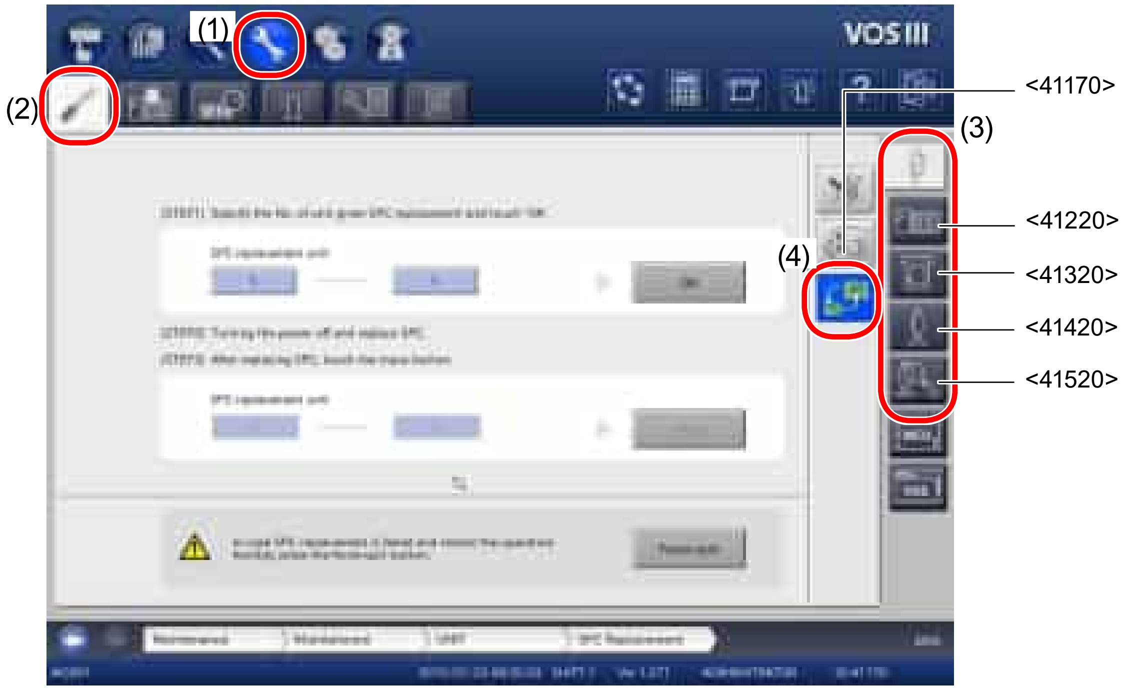
<41520> Inspector SPC replacement

When replacing the inspector SPC, all data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the SPC.

* This screen displays when using a spin inspector Type-A specification.

SPC replacement

1. **After touching (1), (2) and (3) in order, touch and select one of the icons from (4).**
2. **Follow the procedure on the screen to operate.**

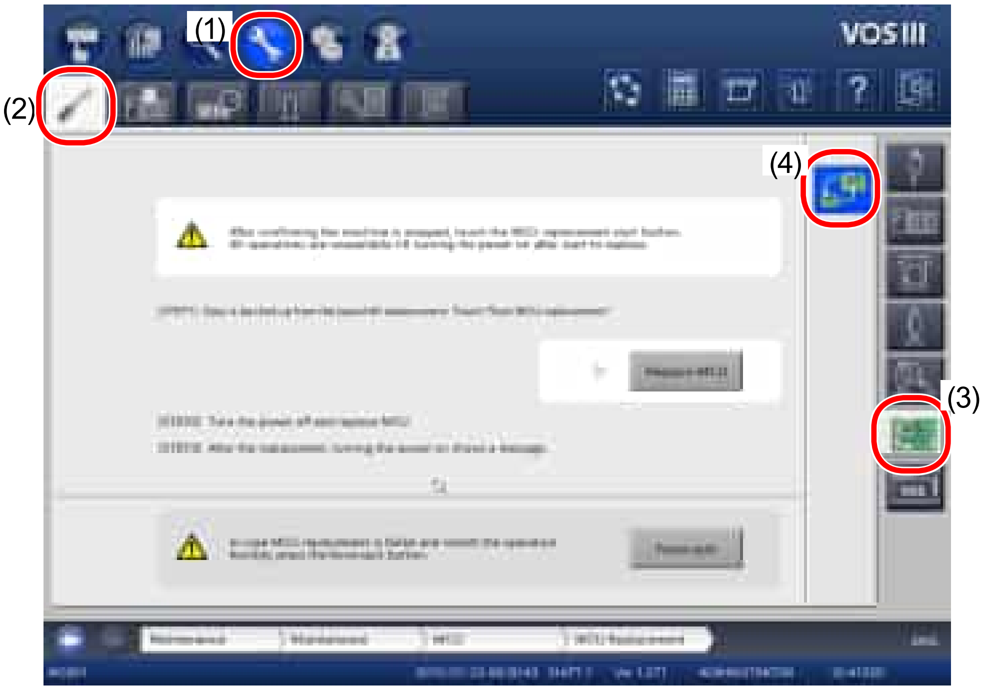


<41620>   MCU replacement

When replacing the MCU, all data before the replacement can be automatically copied.
Always follow the procedure on the screen when replacing the MCU.

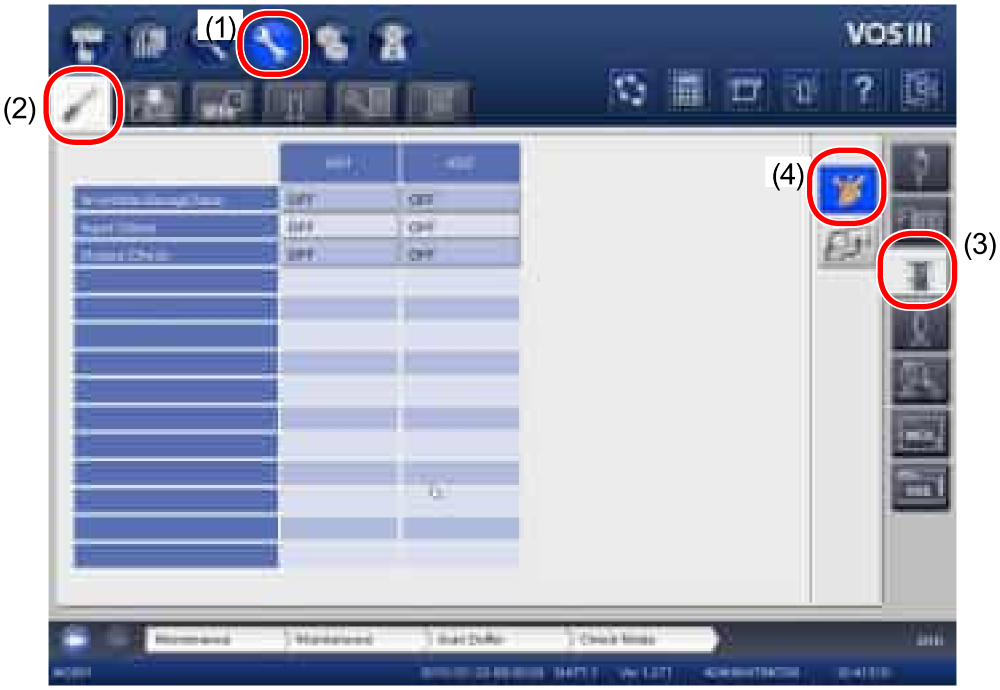
MCU replacement

1. **Touch (1), (2), (3) and then (4).**
2. **Follow the procedure on the screen to operate.**



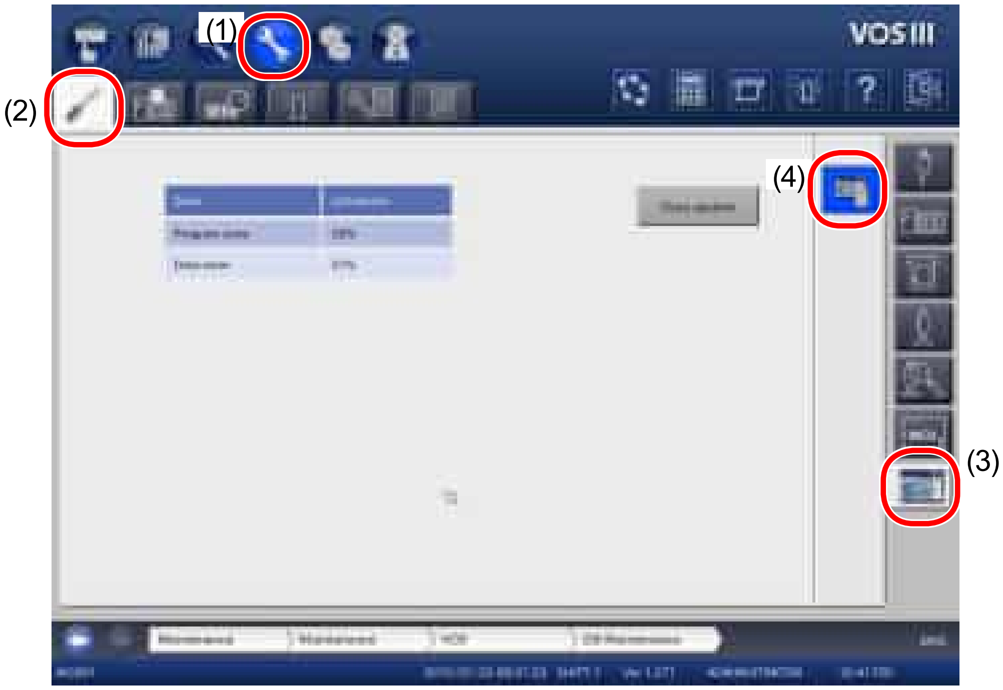
<41310>   AD check mode

All check mode settings can be performed for the AD.



<41720> VOS maintenance

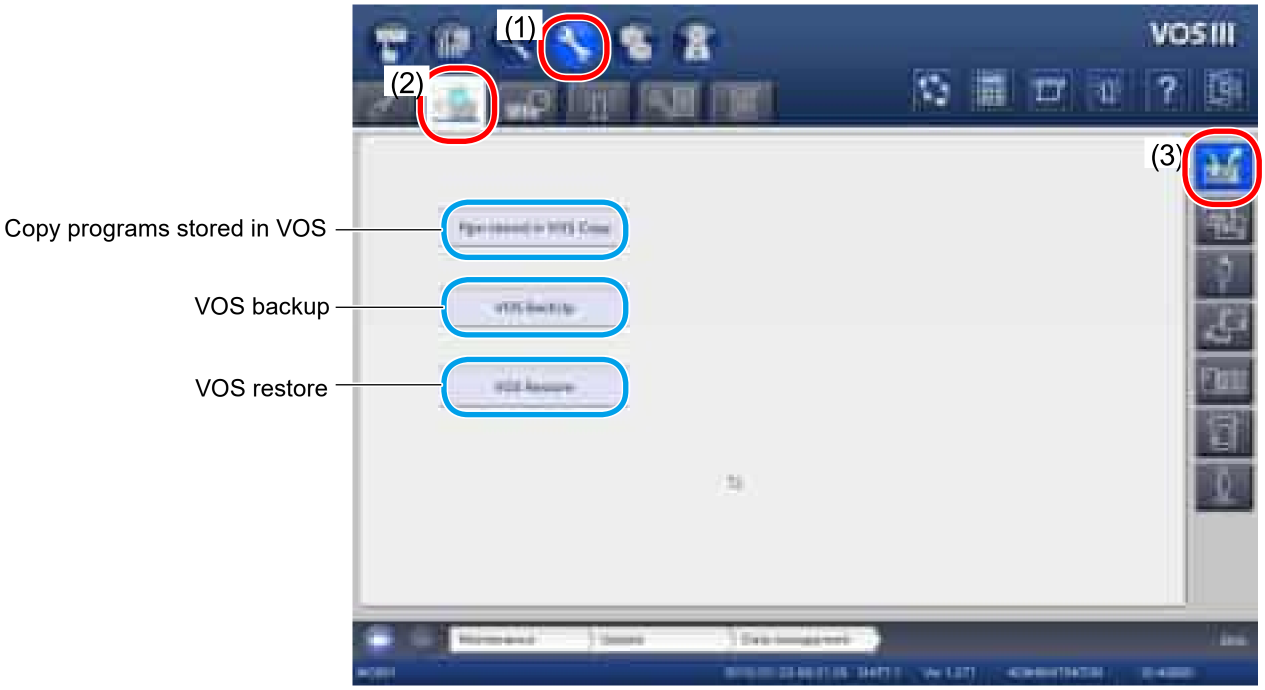
The range for the data being used in VOS can be checked.


(1)
(2)
(4)
(3)
VOS III

<42800> Update > Data management

VOS backup and recovery functions are available. In addition, programs for each device (VOS, MCU, unit, drum driver, main machine, AD, CBF, supply unit and spin inspector) can be updated.

* This screen displays when using a spin inspector Type-A specification.

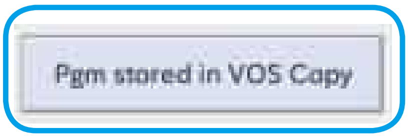

(1)
(2)
(3)
VOS III
Copy programs stored in VOS
VOS backup
VOS restore

Copy programs stored in VOS

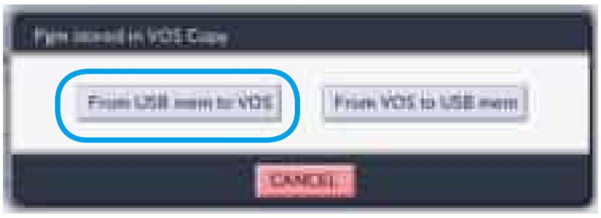
The programs for each device (VOS, MCU, unit, drum driver, main machine, AD, CBF, supply unit, and spin inspector) stored in the VOS are updated.
In addition, the programs stored in the VOS can be copied to the USB memory.

- **Update VOS stored programs**

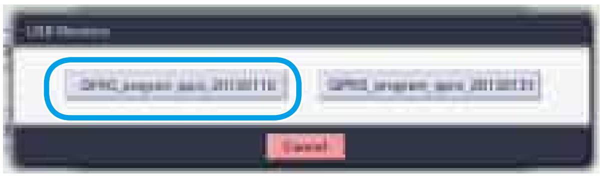
1. **Set up the USB memory and link it with the VOS.**


Pgm stored in VOS Copy

2. **Touch “Pgm stored in VOS Copy.”**

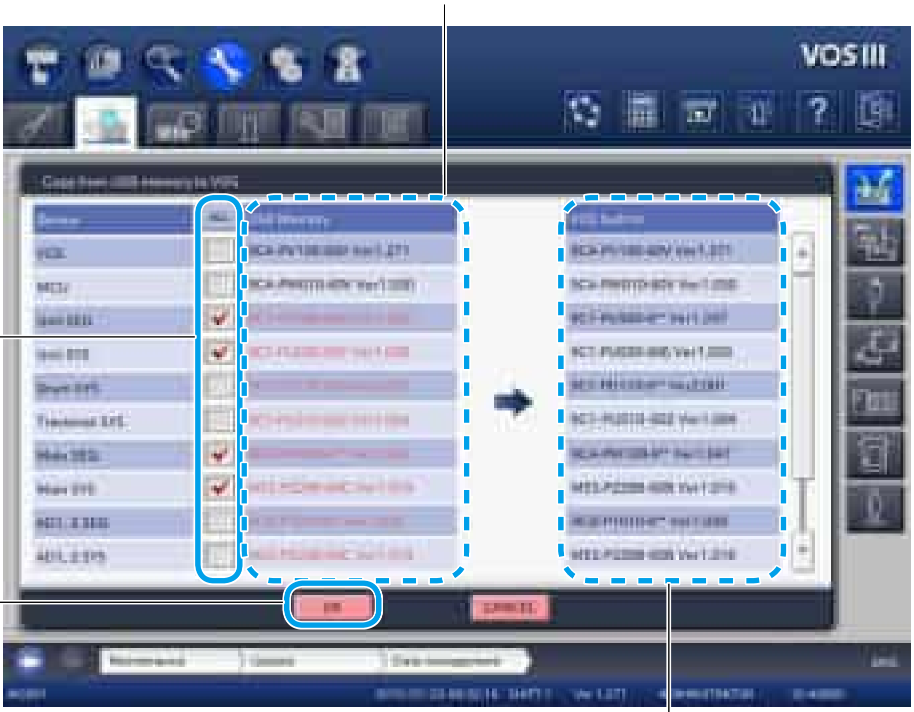

Pgm stored in VOS Copy
From USB mem to VOS
From VOS to USB mem
CANCEL

3. **Touch “From USB mem to VOS.”**


USB Memory
Cancel

4. **Select a set of VOS stored programs in the USB memory.**

USB memory programs


VOS III
OK
CANCEL

5. **Select the programs you want to update.**

6. **Touch “OK” to confirm.**
The VOS stored programs are updated.

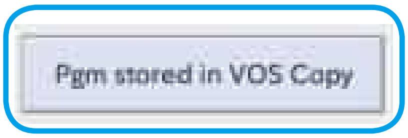
Current VOS stored programs

* Downloading to each device for the VOS stored programs requires a separate operation.

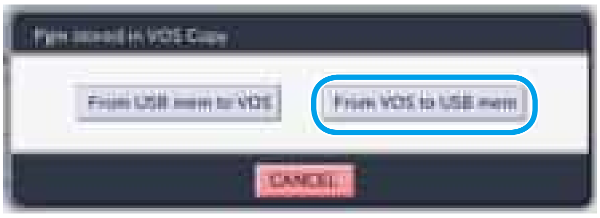
- **Removing VOS stored programs**

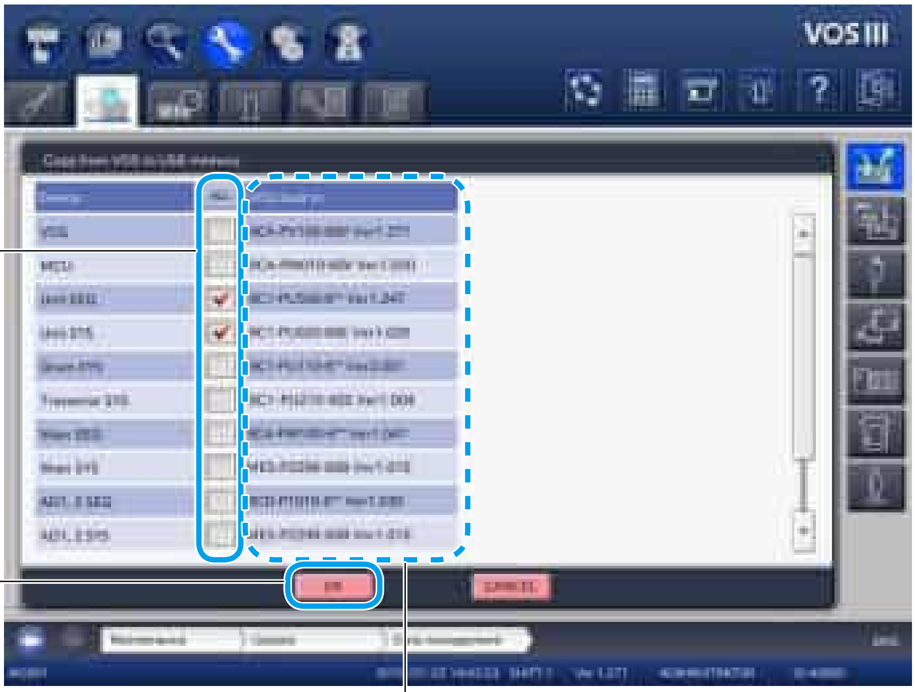
1. **Set up the USB memory and link it with the VOS.**

2. **Touch “Pgm stored in VOS Copy.”**


Pgm stored in VOS Copy

3. **Touch “From VOS mem to USB.”**


Pgm stored in VOS Copy
From USB mem to VOS
From VOS to USB mem
CANCEL


VOS III
OK
CANCEL

4. **Select the programs you want to update.**

5. **Touch “OK” to confirm.**
   Copy the programs stored in the VOS to the USB memory.

Current VOS stored programs

VOS backup

A VOS backup file is created. All VOS data, from the point in time when the VOS backup file is created, is saved. Using a VOS recovery operation, you can restore the data to the point of time it was saved, as outlined in the next section.

* When performing a VOS version upgrade, a VOS backup file is automatically created from the data that existed before the version upgrade.

1. **Set up the USB memory and link it with the VOS.**
2. **Touch "VOS backup.”**
   The VOS backup file is created in the USB memory.

* The file created shows the VOS version and the date.

* If the USB memory has not been set up and linked with the VOS, a backup file cannot be created.

VOS restore

The VOS is restored. The data is restored to the same point in time when the VOS backup file was created.

1. **Set up the USB memory and link it with the VOS.**
2. **Touch "VOS restore.”**
3. **Select the VOS backup file for the period of time you want to restore.**
   The restoring operation is automatically executed.

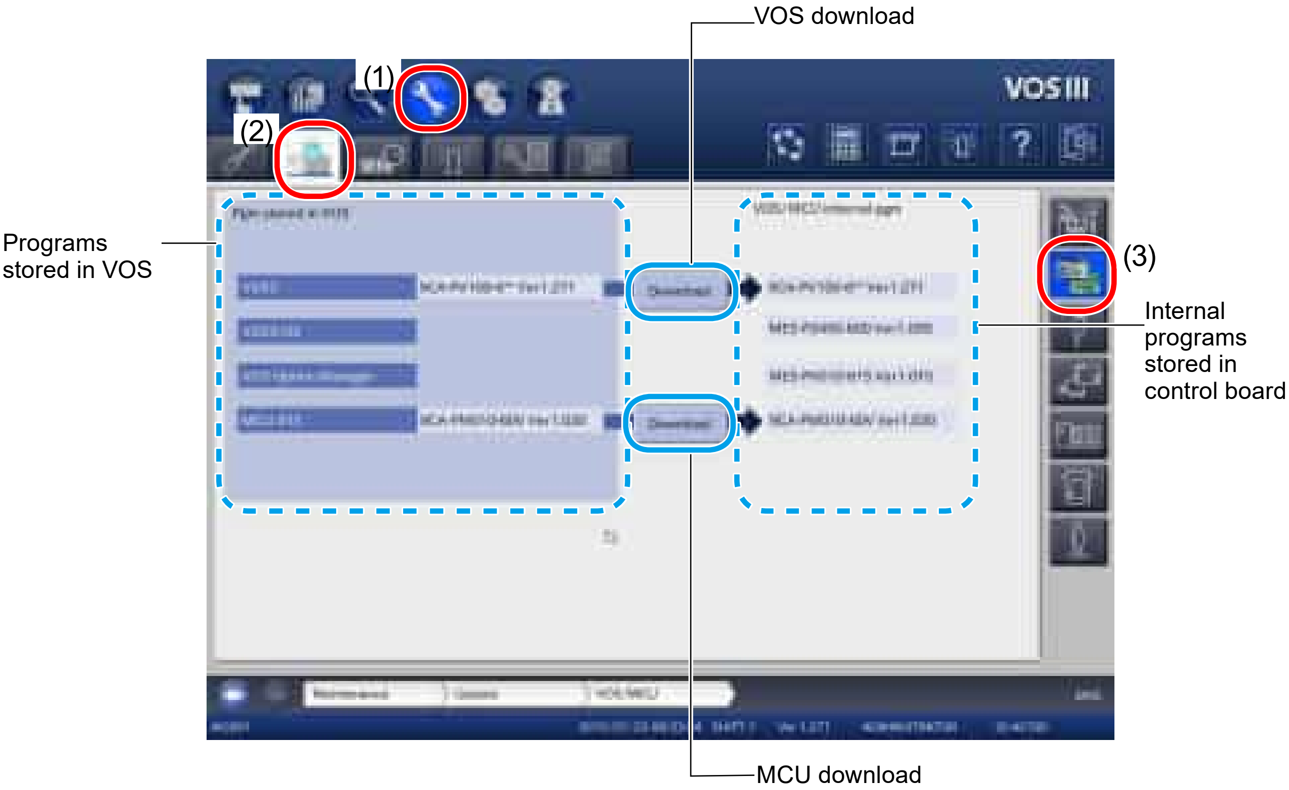
* If the USB memory has not been set up, it will be restored to the previous version.

6
Sec

<42100> Update > VOS/MCU

The VOS and MCU programs can be downloaded.

* The MCU is a communications board that mainly controls the communication network.


VOS download
VOS III
(1)
(2)
Programs stored in VOS
(3)
Internal programs stored in control board
MCU download

VOS3	Product number and version of VOS3 program
VOS3-OS	Product number and version of VOS3-OS program
MCU SYS	Product number and version of MCU system program

Download method

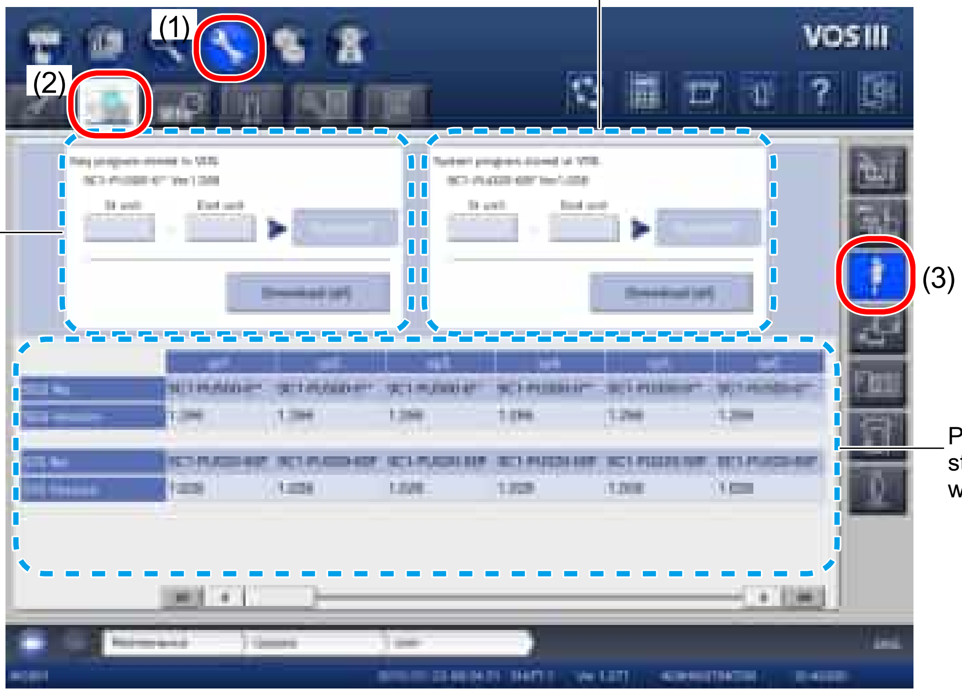
Touch “Download.”

<42300> Update > Units

The program that controls the winding unit operations can be downloaded to the winding unit.

Sequence programs stored in VOS

System programs stored in VOS

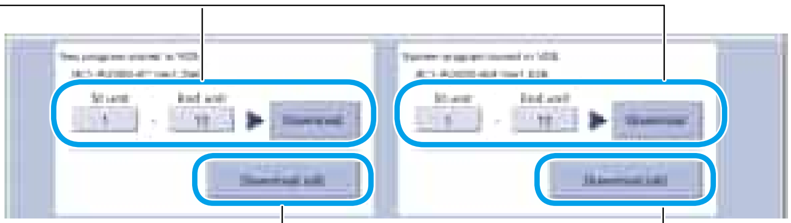


Programs stored in the winding unit

Sequence program (SEQ) and system program (SYS) download

- **Specify the winding unit and touch “Download.”**

  * Inputting the “End unit” is not required when only downloading one winding unit.

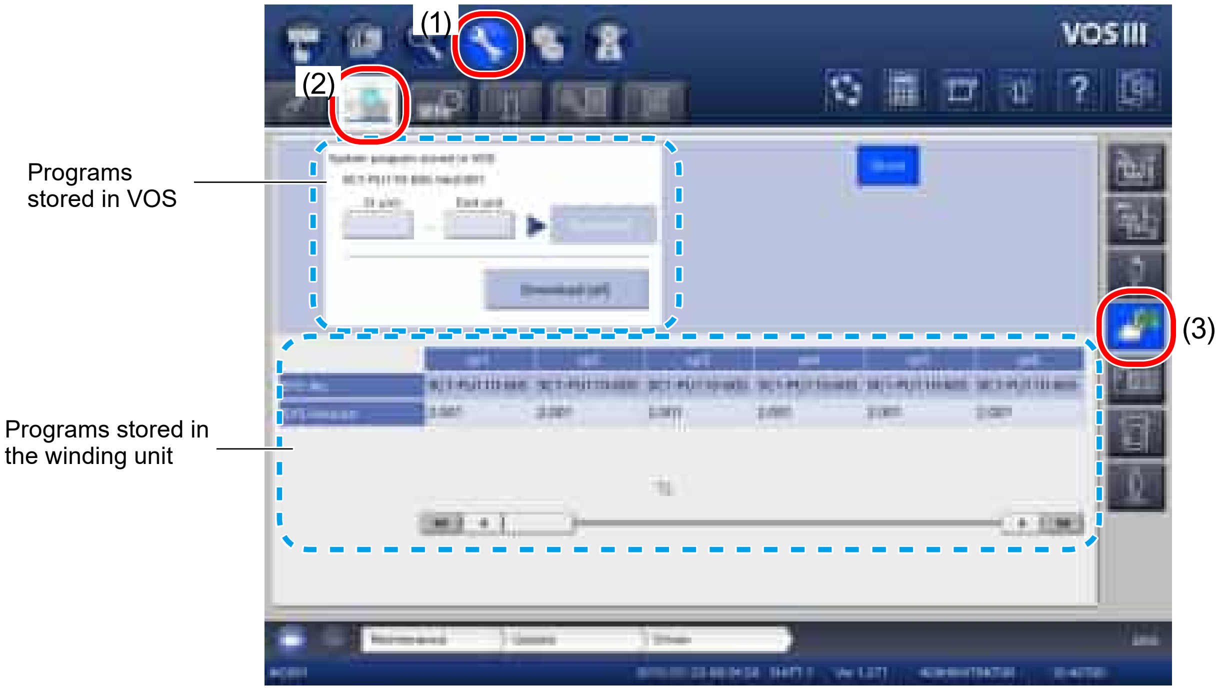


- **If all winding units apply, touch “Download (all).”**

* When downloading the system program, after downloading it, the sequence program will also automatically download.

<42700> Update > Driver

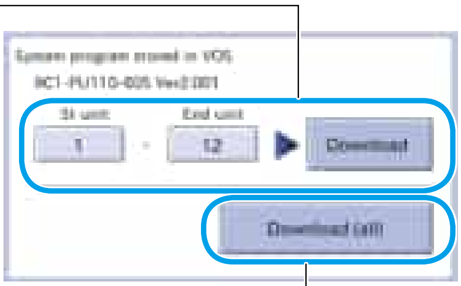
This screen is for downloading programs stored in VOS for the drum driver.


(1)
(2)
(3)
VOS III
Programs stored in VOS
Programs stored in the winding unit

System program (SYS) download

- **Specify the winding unit and touch "Download."**

  * Inputting the "End unit" is not required when only downloading one winding unit.


System program stored in VOS
RC1-PU110-005 Ver2.001

St unit: 1
End unit: 12

Download
Download (all)

- **If all winding units apply, touch "Download (all)."**

<42200> Update > Main machine

The program that controls the operations for the main machine can be downloaded to the main machine.

<42400> Update > AD

The program that controls the AD operations can be downloaded to the AD.

<42510> Update > CBF

The program that controls the CBF operations can be downloaded to the CBF.

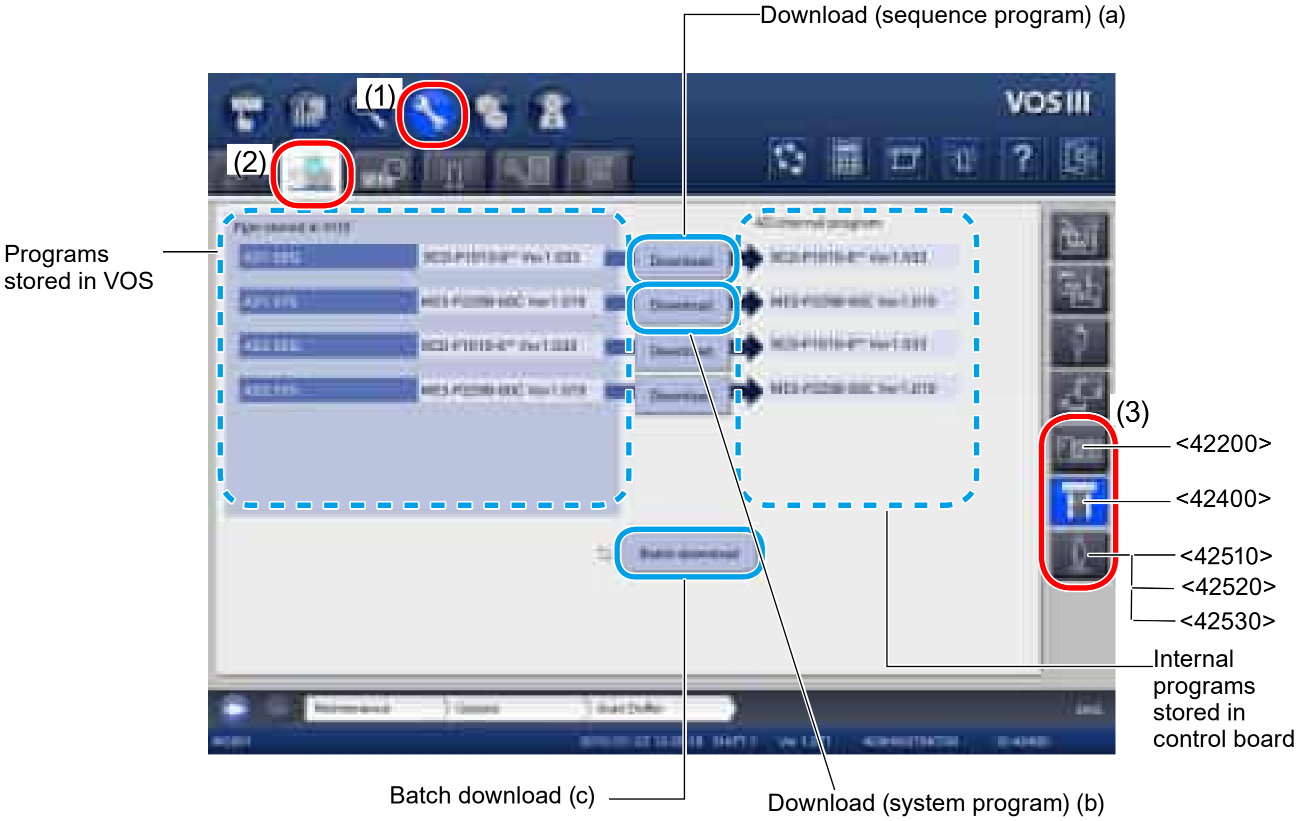
<42520> Update > Supply units

The program that controls the supply unit operations can be downloaded to the supply unit.

<42530> Update > Spin inspector

The program that controls the spin inspector operations can be downloaded to the spin inspector.

* This screen displays when using a spin inspector Type-A specification.

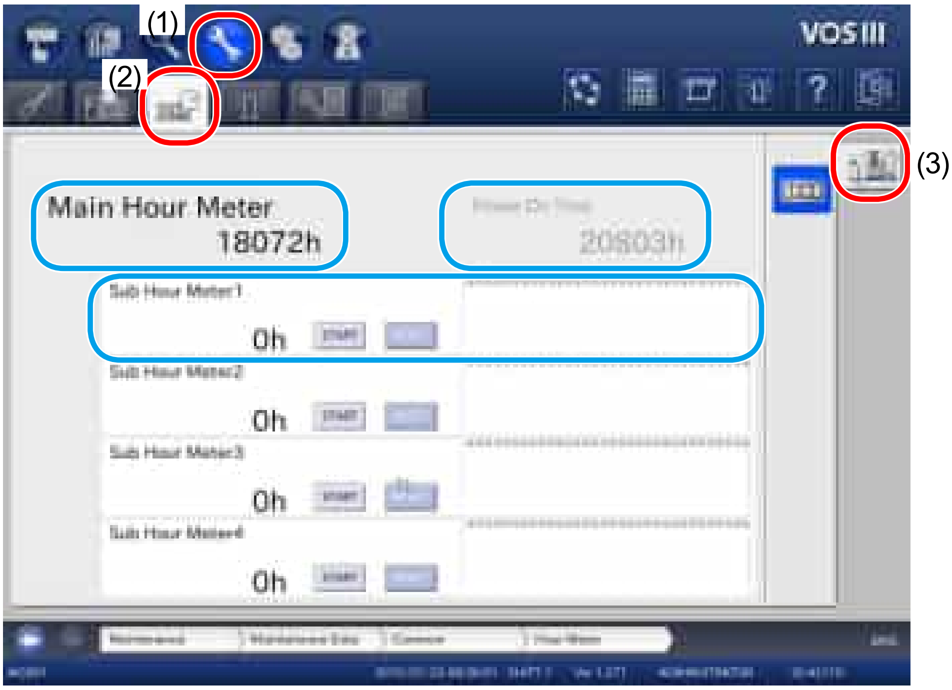

Download (sequence program) (a)
VOS III
(1)
(2)
Programs stored in VOS
(3)
<42200>
<42400>
<42510>
<42520>
<42530>
Internal programs stored in control board
Batch download (c)
Download (system program) (b)

- **Sequence program (SEQ) download**
  Touch “Download” (a).
- **System program (SYS) download**
  Touch “Download” (b).

  * After downloading the system program, the sequence program will also automatically download.
- **Batch download**
  Download all programs in the screen window all at once by touching “Batch download (c).”

<43110> Hour meter

The ON time for the machine's power and the operation time can be monitored.
In addition, it is equipped with a Sub Hour Meter so specific timing periods can be recorded.



Main Hour Meter
18072h

Power On Time
20803h

Sub Hour Meter1
0h

Sub Hour Meter2
0h

Sub Hour Meter3
0h

Sub Hour Meter4
0h

Main Hour Meter	Displays the total operation time for the machine. The operation time cannot be reset.	
Sub Hour Meter	4 Sub Hour Meters can be used.	
	START	Starts the time recording.
	STOP	Stops the time recording.
	RESET	The time meter is cleared to zero.
	MEMO	The keyboard is opened and allows the user to input text.
Power On Time	The ON time for the power is displayed. The power ON time cannot be reset.	

<44200> Unit alarm summary

The number of alarms that occurred on the winding unit is logged, and the log for the current shift and the previous 14 shifts is displayed.

<44100> Main machine alarm summary

The number of alarms that occurred on the main machine is logged, and the log for the current shift and the previous 14 shifts is displayed.

<44300> AD alarm summary

The number of alarms that occurred on AD machine is logged, and the log for the current shift and the previous 14 shifts is displayed.

<44400> CBF alarm summary

The number of alarms that occurred on CBF is logged, and the log for the current shift and the previous 14 shifts is displayed.

<44500> Spin inspector alarm summary

The number of alarms that occurred on the spin inspector is logged, and the log for the current shift and the previous 14 shifts is displayed.

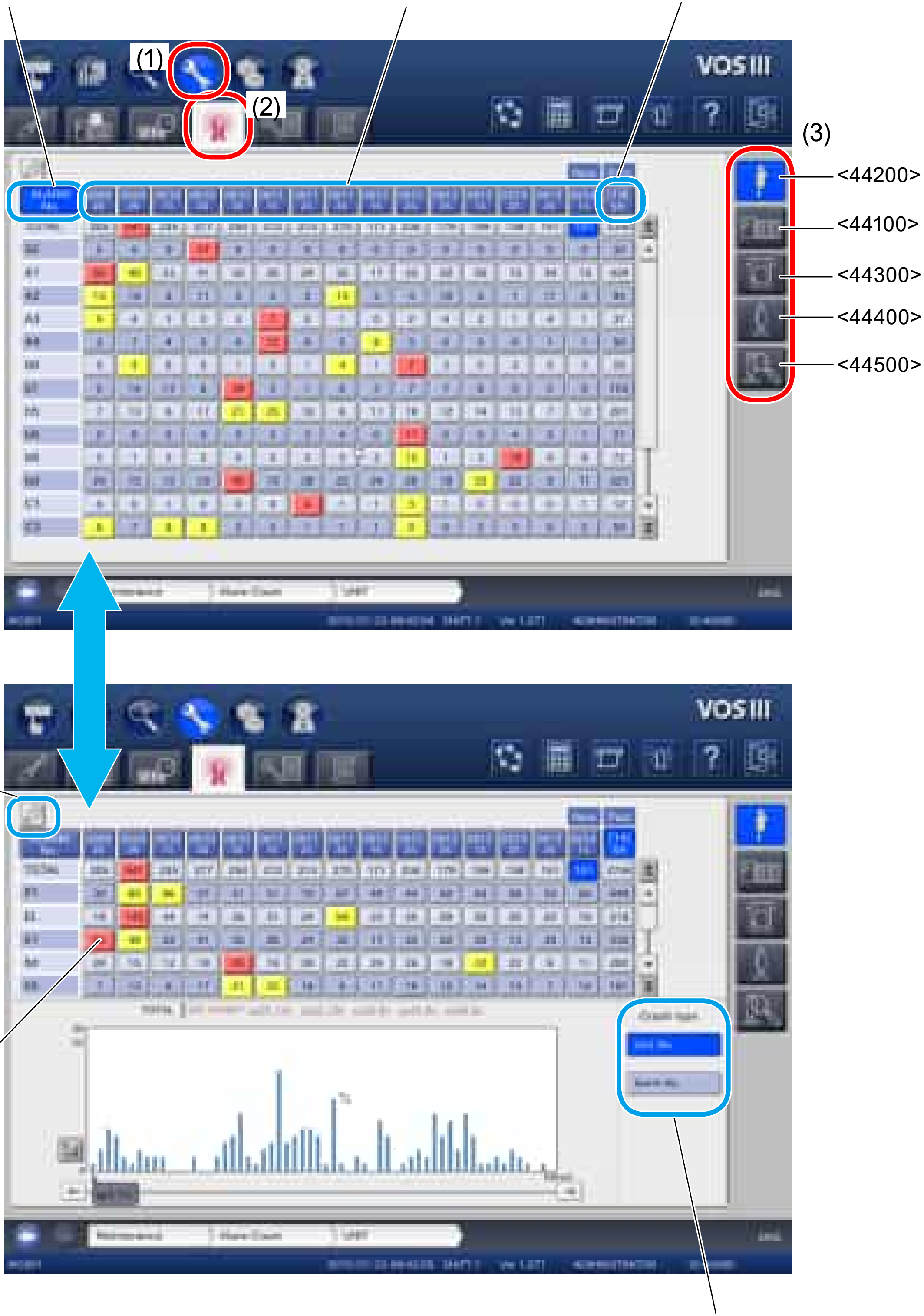
* This screen displays when using a spin inspector Type-A specification.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**

Touch the ALARM No. button to switch the alarm code order.

Touch a shift button to change the alarm order, starting with the alarms that occur most frequently during a shift.

Press and hold the shift button [**] to change the total shift number for alarms that occurred.



Display or hide graph

Touch the table to display the details in the graph.

Change the graph to display according to the unit number or alarm

<45100> Life of the machine alarm logs

These logs display the all alarms that occurred on the machine and the settings that were changed on the machine.

<45300> Unit alarm logs

The log displays all the alarms that have occurred in the winding units.

<45200> Main machine alarm logs

The log displays all the alarms that have occurred in the main machine.

<45400> AD alarm logs

The log displays all the alarms that have occurred in AD.

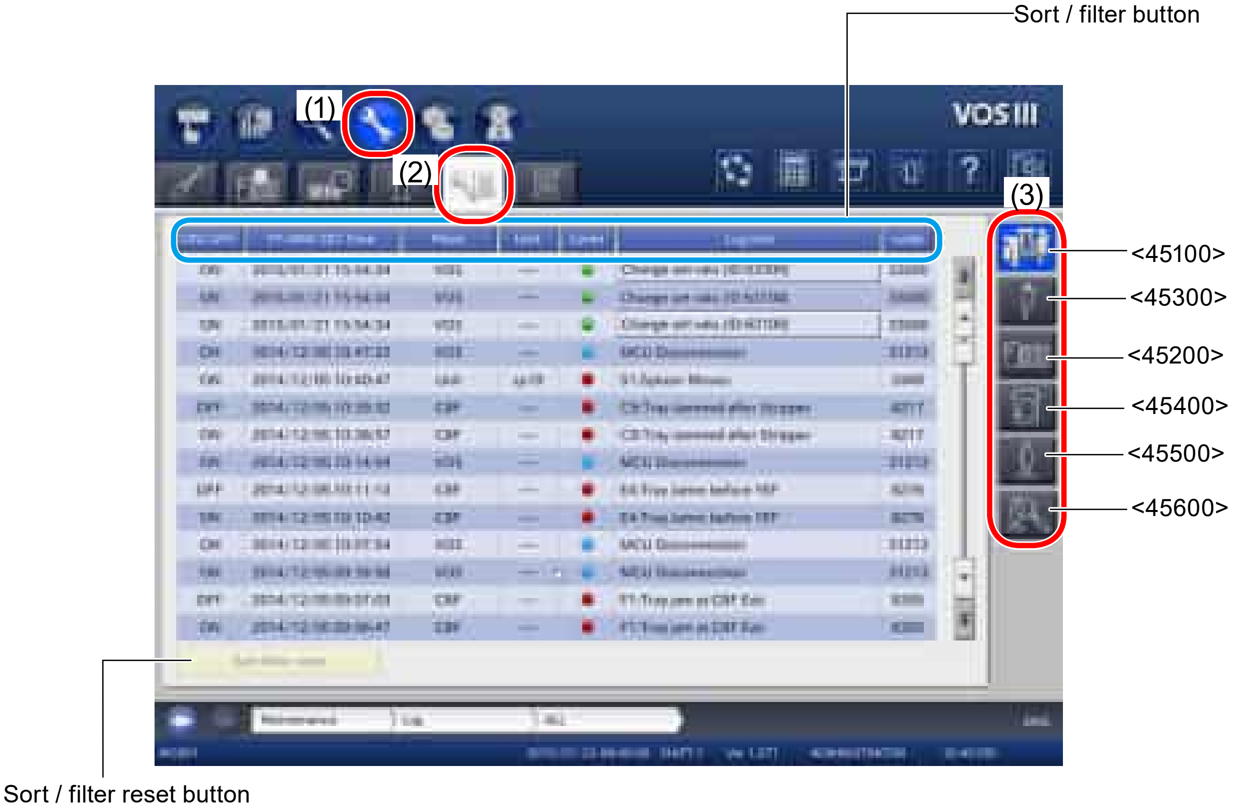
<45500> CBF alarm logs

The log displays all the alarms that have occurred in CBF.

<45600> Spin inspector alarm logs

The log displays all the alarms that have occurred in the spin inspector.

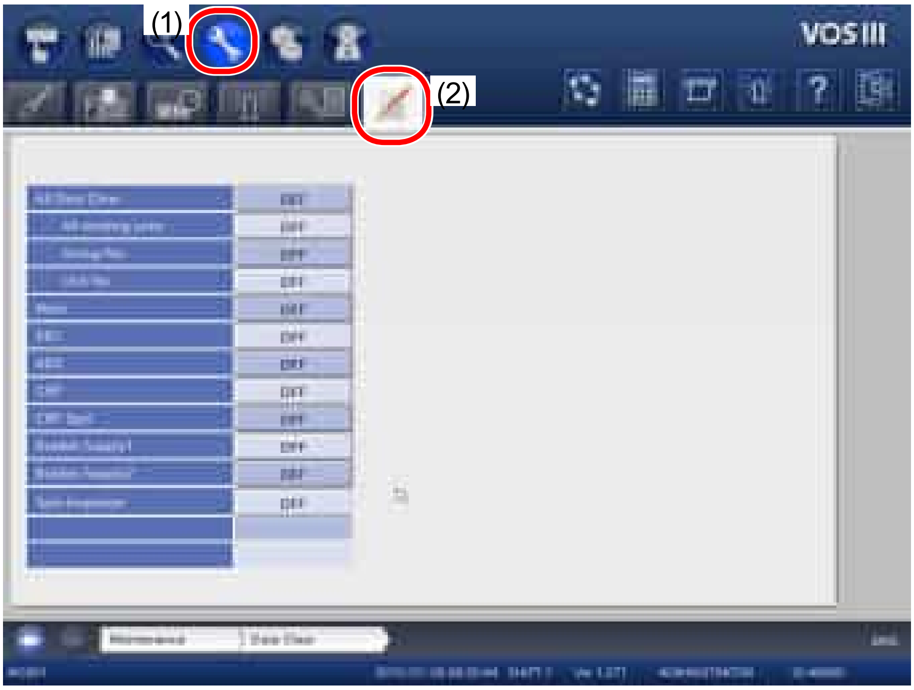
* This screen displays when using a spin inspector Type-A specification.



* Use the sort button to change the display order according to the date/time, place (of alarm), alarm level, alarm information or code.

<48000> Data clear

The operation and quality data, etc., for the machine can be cleared.

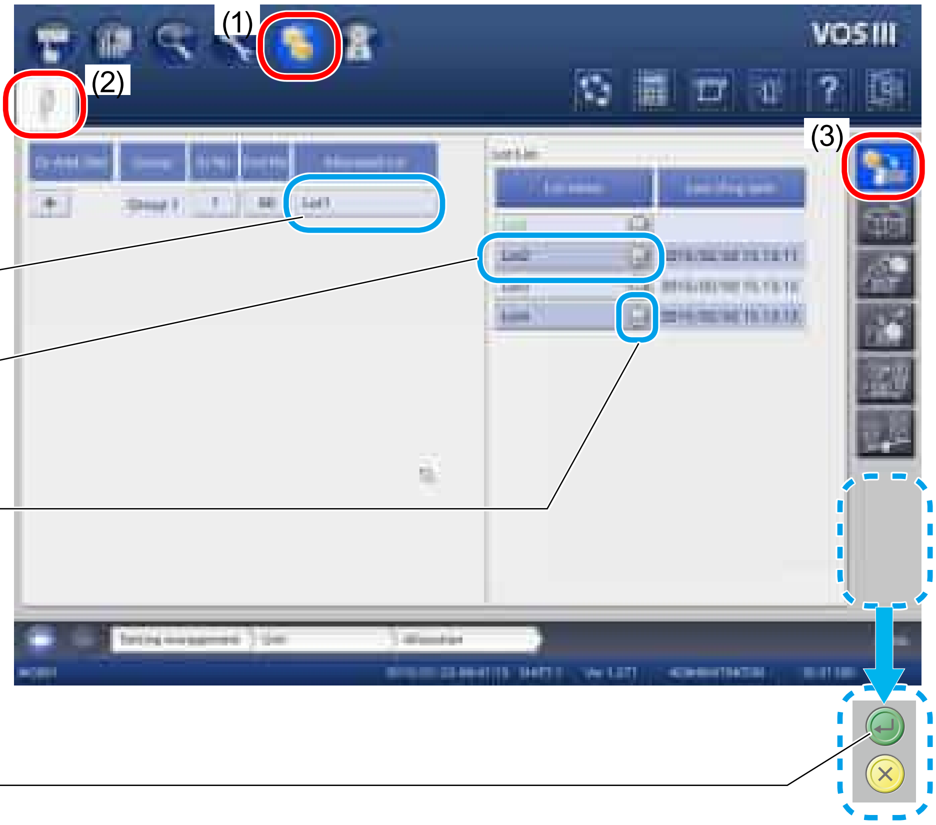


All Data Clear	Clear all device data.
All Winding Units	Clear data for all winding units.
Group No.	Clear unit data in each group.
Unit No.	Clear unit data for each spindle.
AD1, AD2	Clear the data for AD1 and AD2.
CBF	Clear the CBF data.
Spin Inspector	Clear data for the spin inspector. * This screen displays when using a spin inspector Type-A specification.

Sec 7 Setting management

The lot can be both changed and deleted from the memory.
Both operations are accessed from “Lot Management” in the main menu.

<51100> Lot allocation



1. **Touch (1), (2) and then (3).**
2. **Select the lot you want to change.**
3. **Touch the lot name you want to allocate.**

   * You can refer to an overview of simple lot settings by touching the “Memo” icon to the right of the saved lot.

4. **Touch “Confirm.”**

* After performing the setting operation, the shift change selection screen is displayed. Select and touch “Yes,” or “No.”

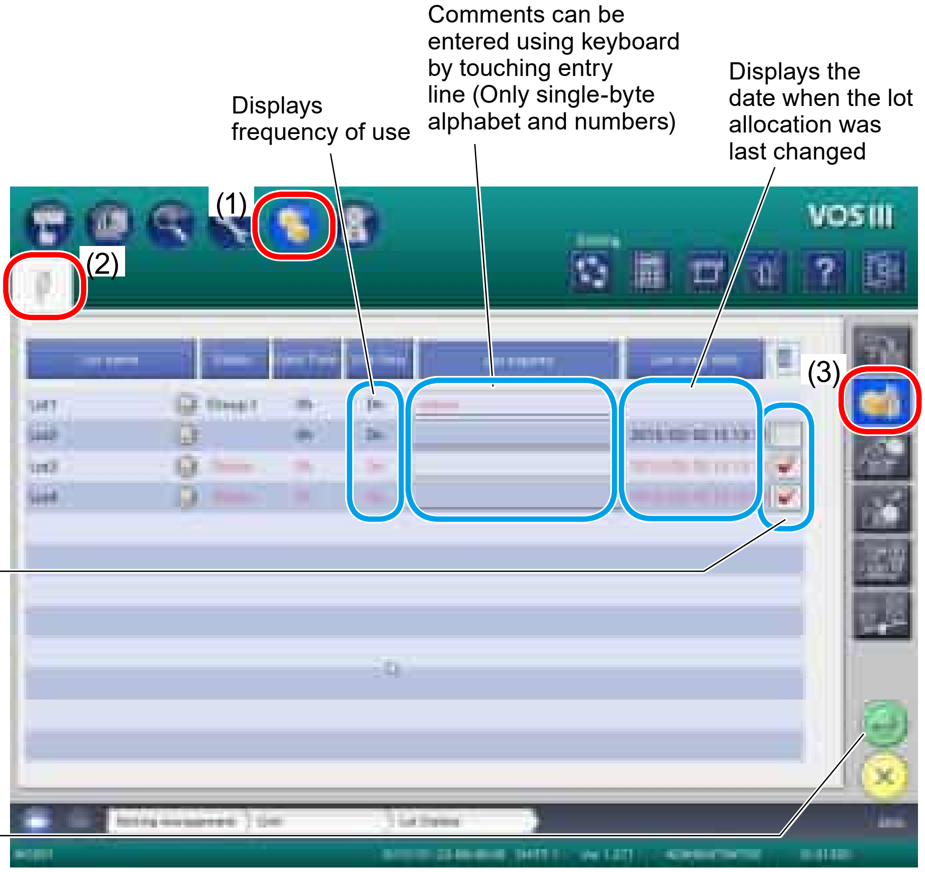
- **Number of registered lots**

Maximum lots: 200
However, a portion of these is used for Murata service technicians.

<51200> Lot deletion

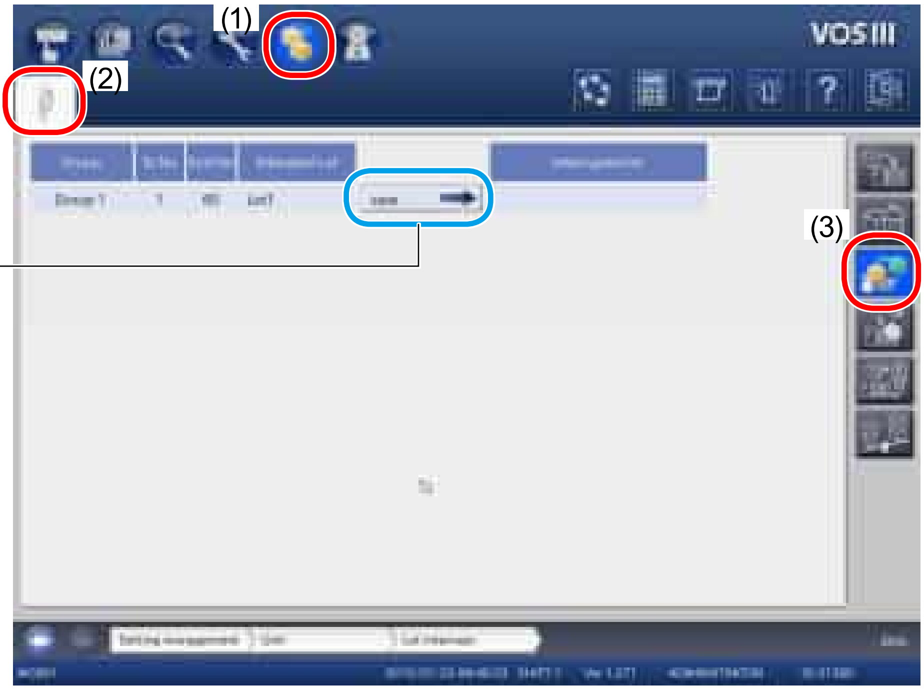
When checking the usage frequency for each lot, the time used and the date when the lot was allocated, you can also delete unnecessary lots and organize the data.
You can also write and save a comment or memo for a given lot with a lot explanation.

1. **Touch (1), (2) and then (3).**
2. **Touch the check box of the lot that you want to delete.**
   Multiple lots can be selected.
   * Lots that have been allocated cannot be deleted.
3. **Touch "Confirm."**


Displays frequency of use
Comments can be entered using keyboard by touching entry line (Only single-byte alphabet and numbers)
Displays the date when the lot allocation was last changed
(1)
(2)
(3)
VOS III

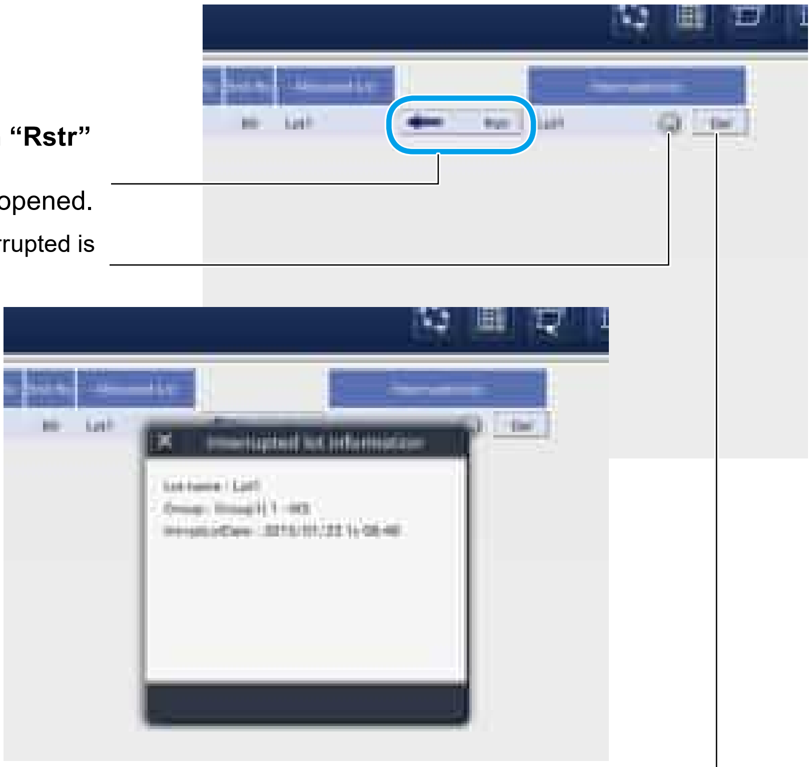
<51300> Lot interruption

A current lot can be replaced with another lot while in use. The interrupted lot can be restored when the operation of the other lot is completed by restoring.



1. **Touch "save" for the lot that you want to interrupt.**
   The lot is saved.

2. **Allocate another lot. (Refer to Section 7 "<51100> Lot Allocation" for the allocation method.)**

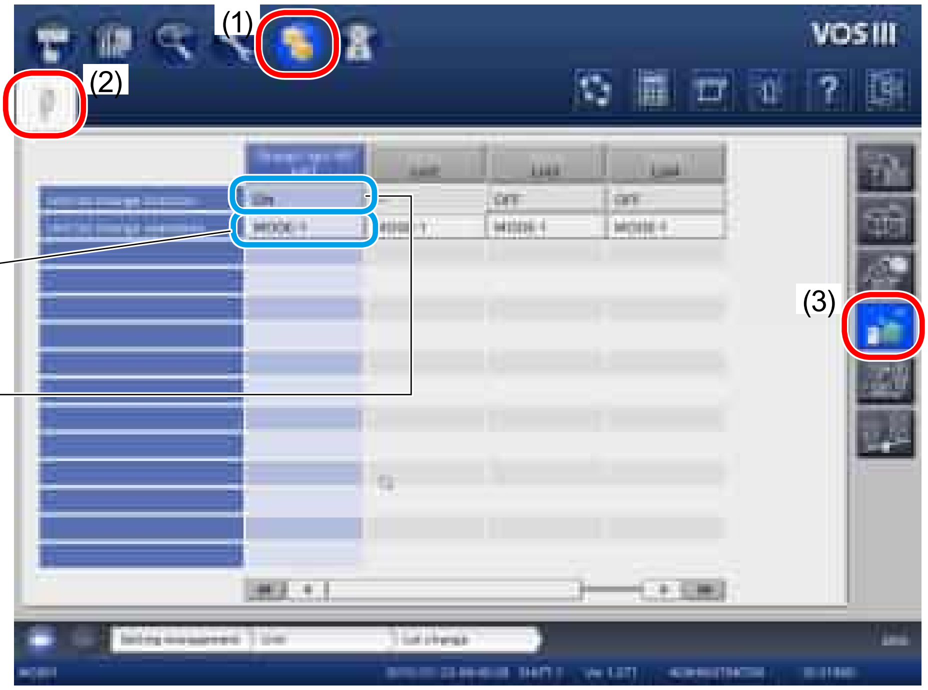


3. **To re-open an interrupted lot, touch "Rstr" (restore) for the interrupted lot.**
   The interrupted lot is allocated and re-opened.
   * Information such as the date and time interrupted is displayed by touching the "memo" icon.

* The lot interrupted can be deleted by touching "Del" (delete).

<51600> Unit lot change

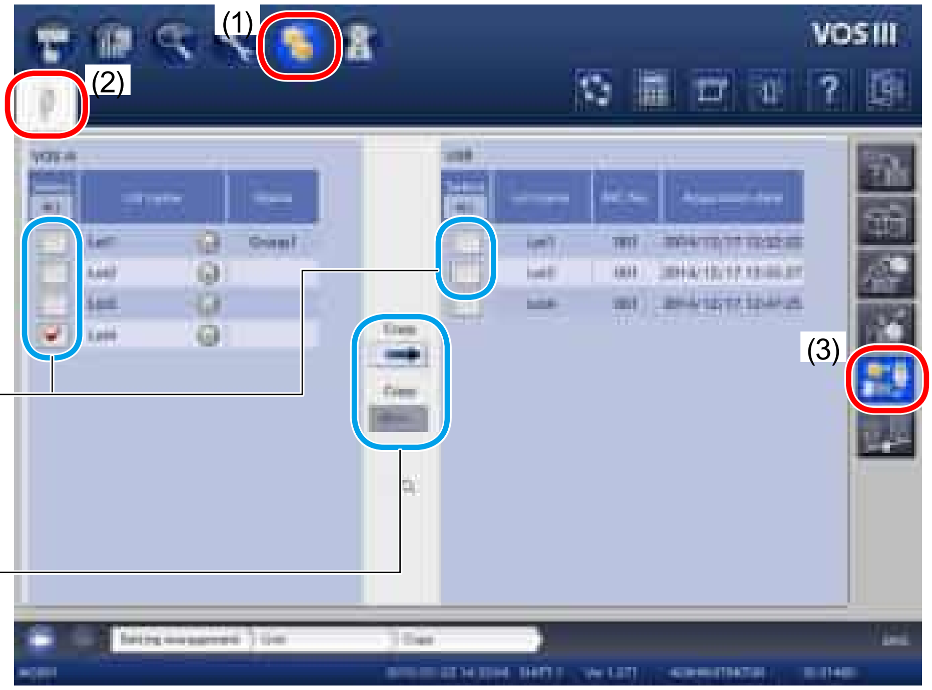
Turn ON the unit lot change function to reduce the operator's work for a lot change.



1. **Touch (1), (2) and then (3).**
2. **Select the operation mode.**
3. **Turn the function ON/ OFF.**

<51400> Lot copy

Each lot can be copied between the VOS and USB.
(Backup files can be saved and copied to other machines)

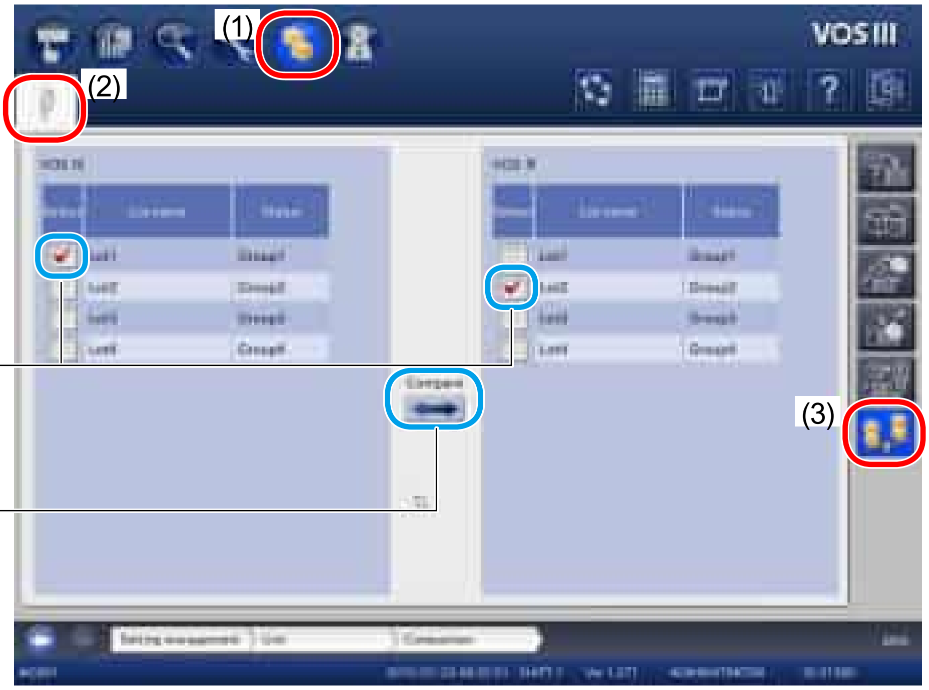


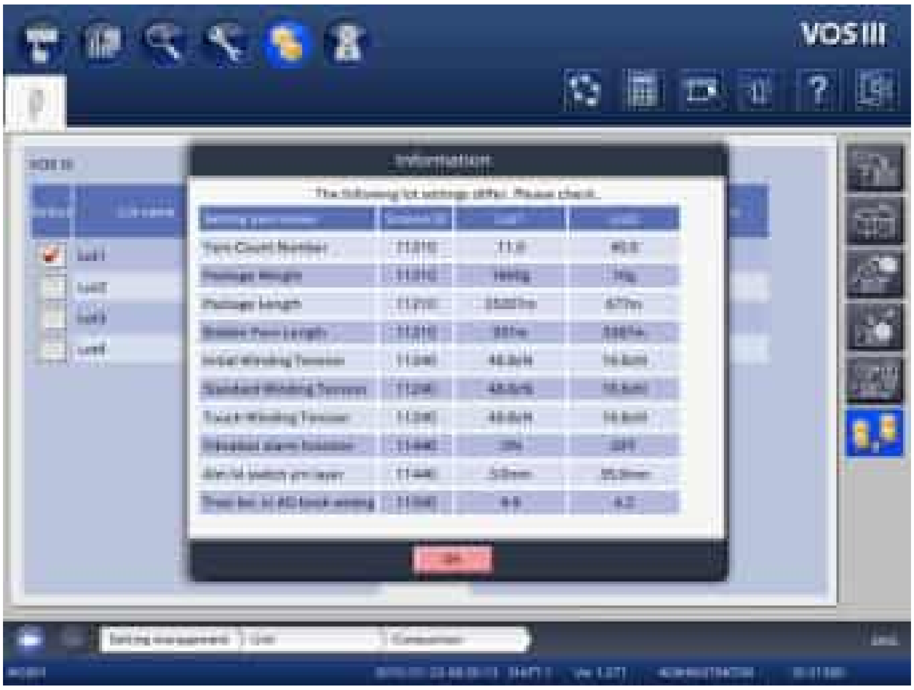
1. **Touch (1), (2) and then (3).**
2. **Touch the check box of the lot that you want to copy.**
   Multiple lots can be selected.
3. **Touch one of the arrows.**

<51500> Lot comparison

The settings for the lots saved in VOS can be compared.

1. **Touch (1), (2) and then (3).**
2. **Touch the check box of the lot that you want to compare.**
3. **Touch the compare button.**

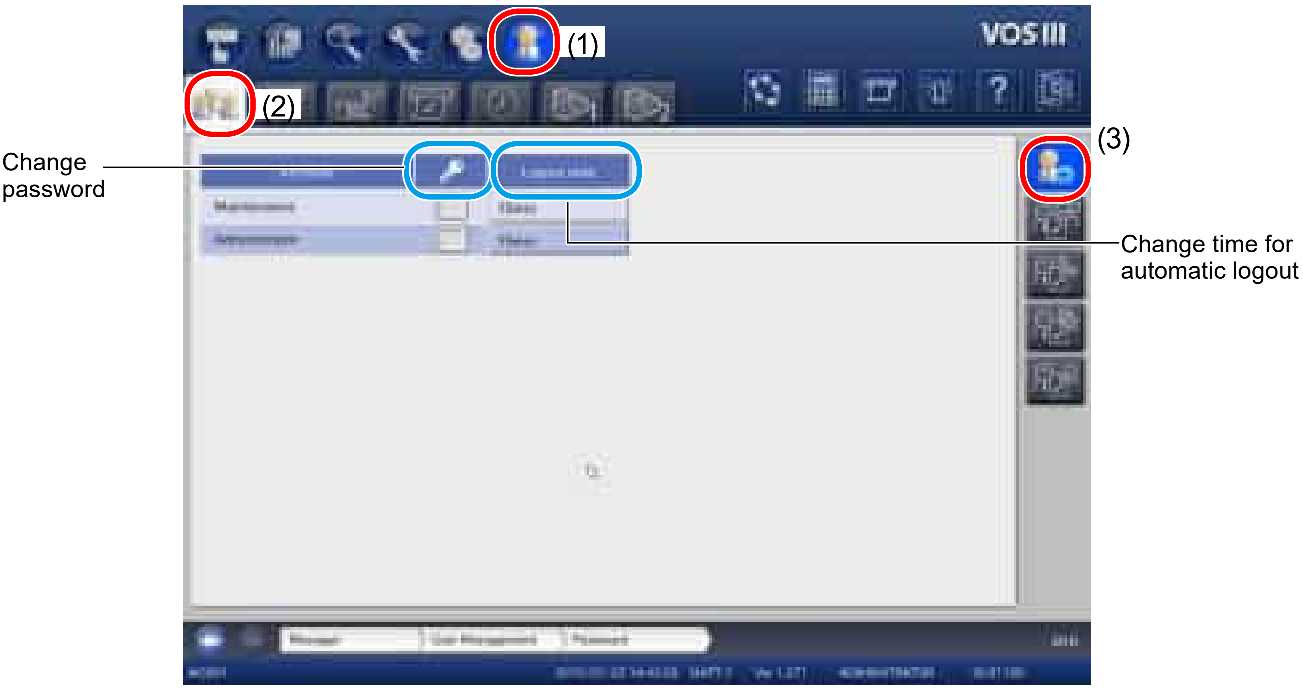




The items that have different settings are displayed.

Sec 8 Administrator screens

<61100> Change password of access level



1. **Login as an ADMINISTRATOR.**
2. **Touch (1), (2) and then (3).**
   The screen ID <61100> is displayed.
3. **Touch corresponding "Password change”.**
4. **Input the new password on the keyboard.**
   - * The 1st letter for each access level is fixed.
     The 1st letter is “M” for the Maintenance access level and “A” for the Administrator access level.
   - * Maximum number of characters is 16.
5. **Input the new password again to confirm.**
6. **Use minutes when inputting the automatic logout time.**

If you forgot your password

If you forgot your password (Administrator), use the following backdoor password to login. When logging in with a backdoor password, your passwords are initialized to the factory default setting. Then, set your maintenance level and administrator level passwords again.

* Backdoor password: rescue

<61210 - 61240> Access property (settings)

Setting of lot setting item access level can be set.

<61310> Access property (maintenance)

Setting of maintenance item access level can be set.

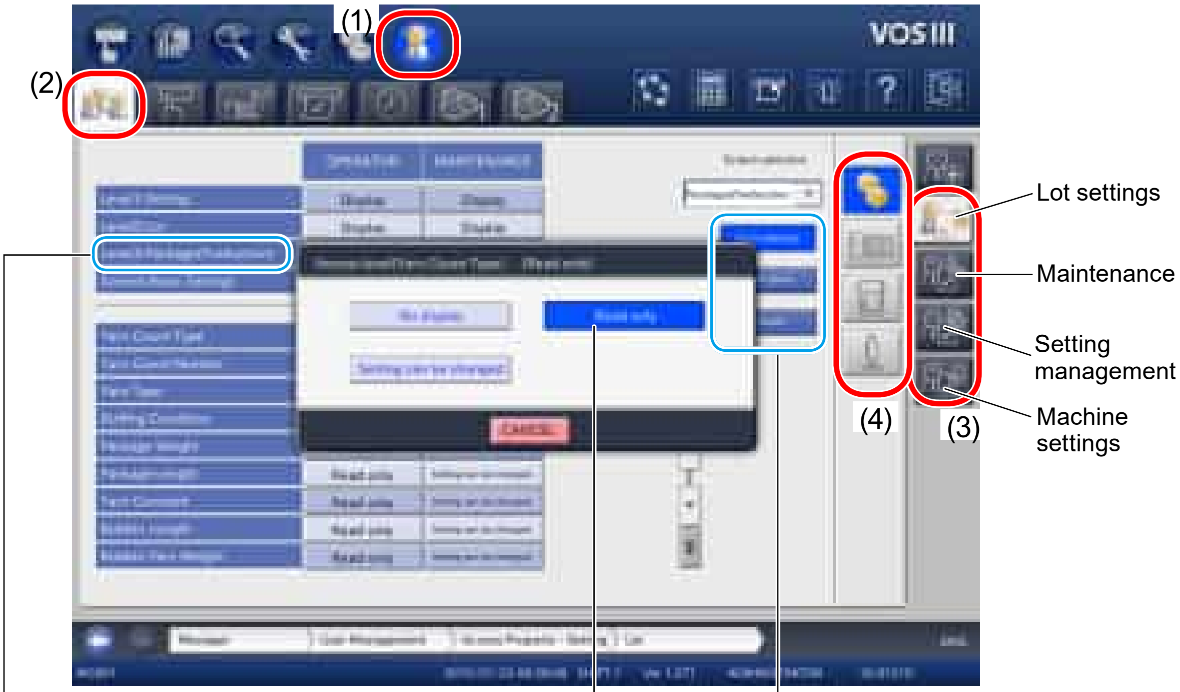
<61610> Access property (setting management)

The access level can be set for an item in the setting management.

<61410 - 61420> Access property (manager)

Setting of machine setting item access level can be set.

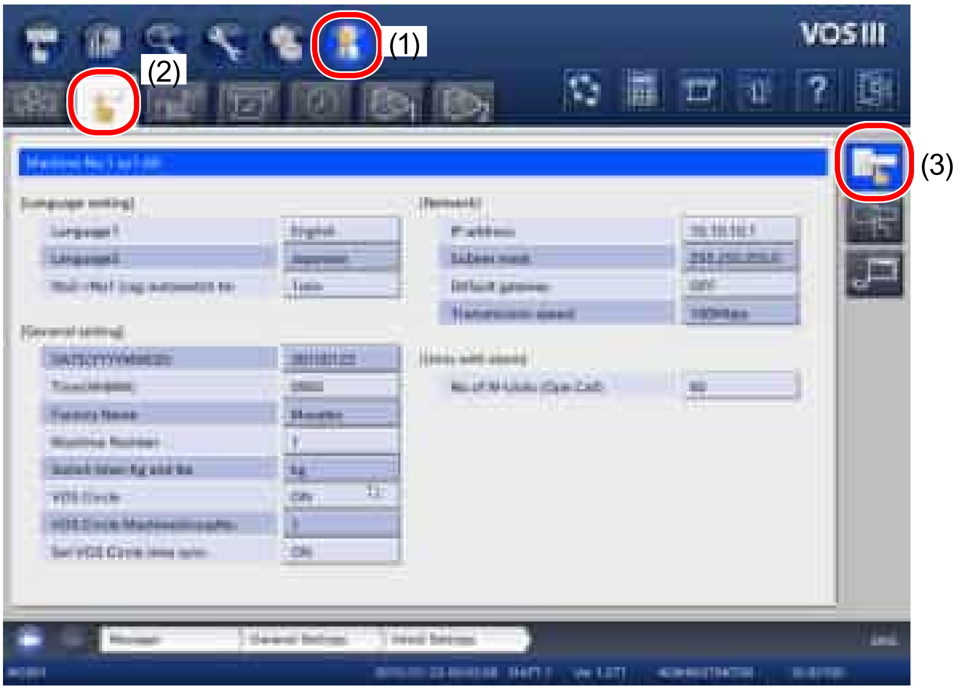
1. **Login as an ADMINISTRATOR.**
2. **After touching (1) and (2) in order, touch and select one of the icons from both (3) and (4).**


(1)
(2)
VOS III
(4)
(3)
Lot settings
Maintenance
Setting management
Machine settings
Switch display items

3. **Touch the item you want to change.**
4. **Touch the level you want to change.**

<62100> Initial settings

The initial settings can be set for general items such as for language, the date/time and the ON/OFF setting for VOS Circle.



- **Language setting**

Language No.1	Set the standard language to be used.
Language No.2	Set the optional language to be used.
Language No.2-> No.1/ Automatic change time limit	Set the time limit when the display language automatically changes back to language No.1.

- **General setting**

Date	Input the current date.
Time	Input the current time.
Factory Name	Input letters.
Switch btwn Kg and lbs	Select the weight unit display.
VOS Circle	Set the VOS Circle to ON/OFF.
VOS Circle Machine Group No.	Set the VOS Circle group that will be connected.
VOS Circle Time Sync.	Set whether to synchronize the time inside the group for VOS Circle.

- **Network**

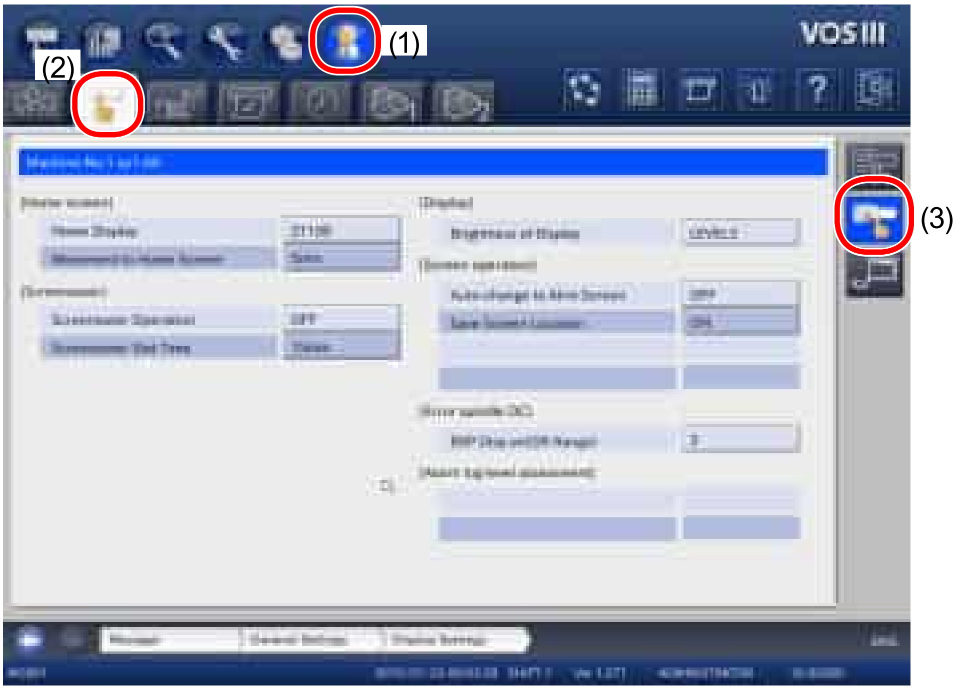
The network settings are for the host communications.
Use when establishing a connection to the Visual Manager and VOS Circle.

- **Number of winding units called by operator**

This setting is used for the number of winding units called by the operator.
When the number of units stopped due to an alarm exceeds the number of winding units for this setting, the signal tower and the rotation signal warning light turn on.

<62200> Display settings

Settings for the VOS screen display can be performed.



- **Home screen**

Home Display	Use the screen ID to specify the screen that will automatically be displayed if no operation has been performed for a certain time period.
Movement to Home Screen	Input the time period when transitioning automatically to the home screen.

- **Screensaver**

Screensaver Operation	This setting activates the screensaver if there is no input on the screen for a certain time period. You can select the following operations.	
	OFF	Turns the function OFF.
	TYPE1	Shows a list of the display data.
	TYPE2	Continues to switch the order of the display data after a certain period of time.
Screensaver Start Time	Input how much time elapses before starting or activating the screensaver.	

- **Display**

Brightness of Display	The level of brightness can be adjusted using a scale from 1 to 5.
	1 **3** **5** Dark <——> Light

- **Screen operation**

Auto-change to Alrm Screen	This setting determines whether to transition to the display screen for the alarm details when an alarm occurs.
Save Screen Position	This setting determines whether to save the screen position that was previously used.

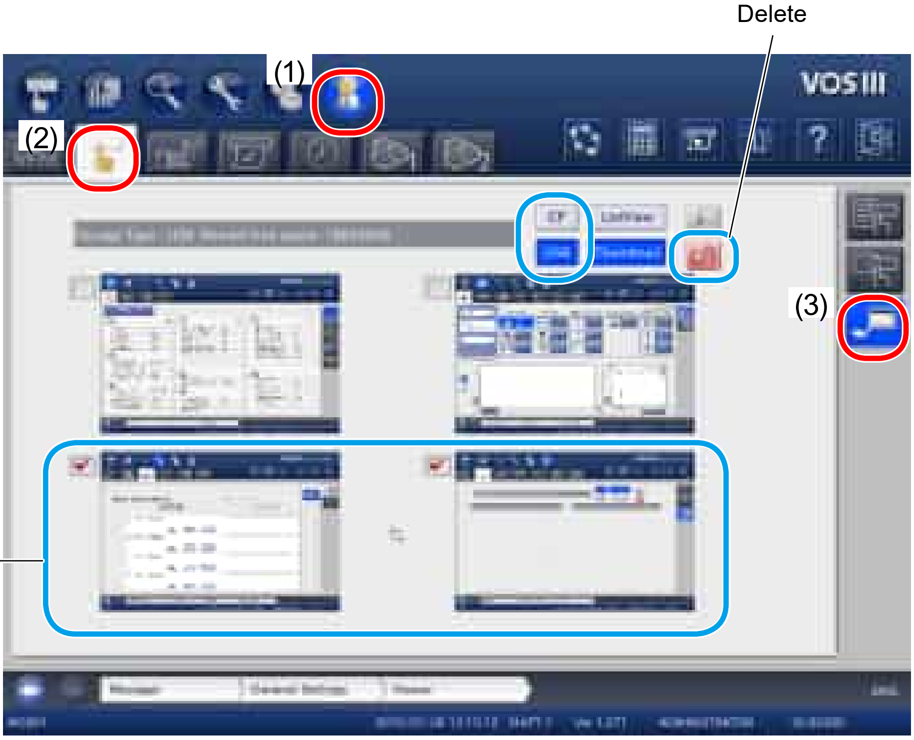
- **Abnormal winding unit display (Error spindle DC)**

If the operation data is continuously used over the number of shifts to which the target is set, the display turns red. If the input value is not reached, the display turns yellow.

<62300> Viewer

1. **Touch “CF” to see the data in the VOS. Touch “USB” to see the data in the USB memory (When a USB memory is connected to the VOS).**

2. **Touch the screen you want to see.**

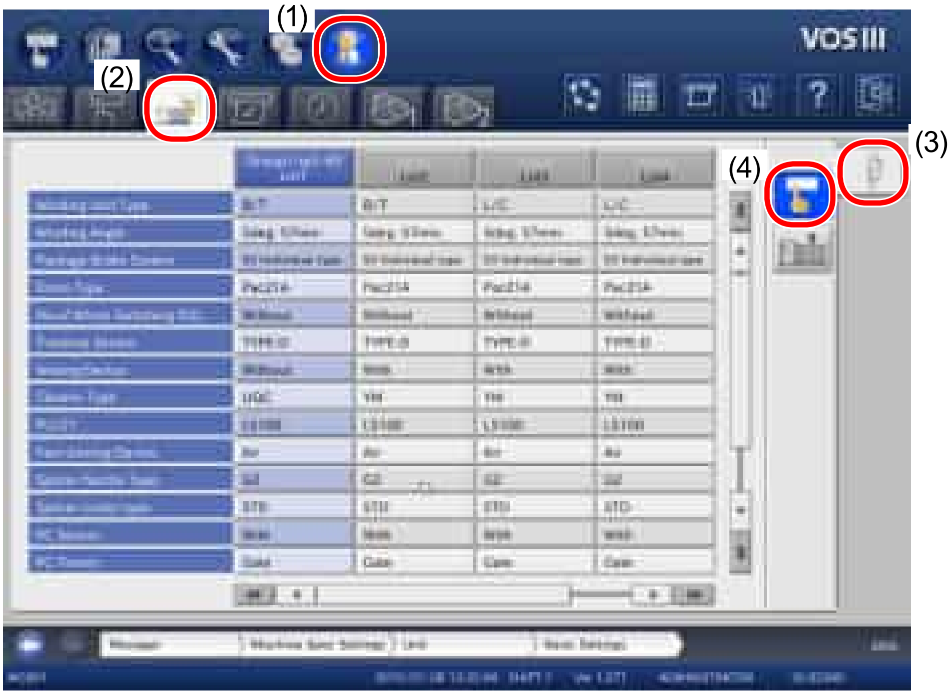


- **Deleting the hard copy data**

1. **Insert a check mark for the data that you want to delete.**
2. **Touch the delete icon.**

<63300> Unit specification settings

The unit specification can be set.

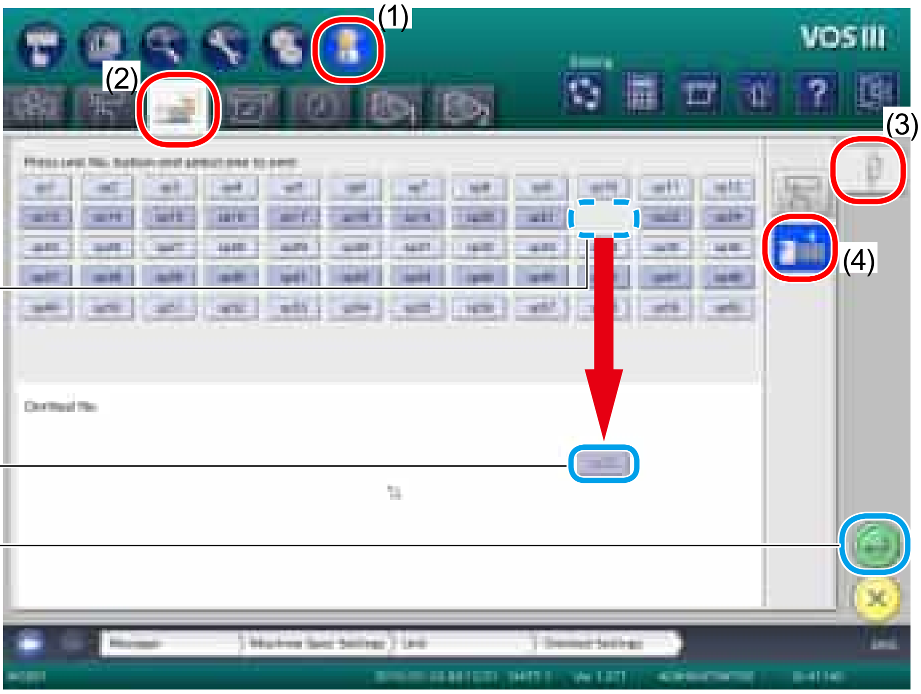


* You can check the explanation for each item by touching the help icon.

<41140> Omit winding unit setting

You can set the winding unit to be either omitted or cancelled.

Omit winding unit setting

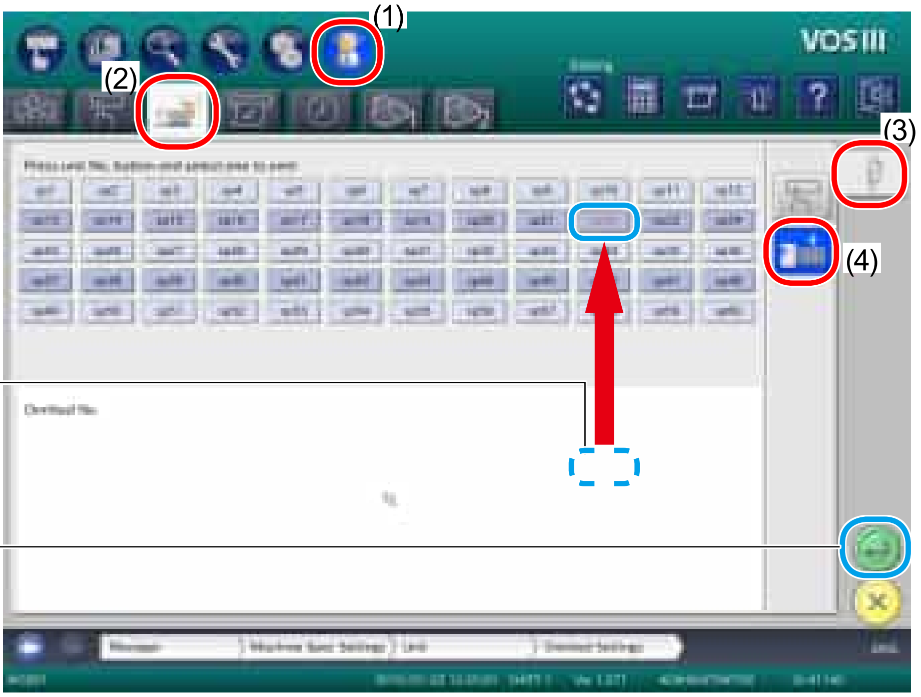


1. **Touch the unit No. you want to set for omission.**

Unit No. selected for omission.

2. **Touch "Confirm."**

Cancel omit winding unit



1. **Touch the Unit No. set for omission.**
2. **Touch "Confirm."**

<64100> Report format settings

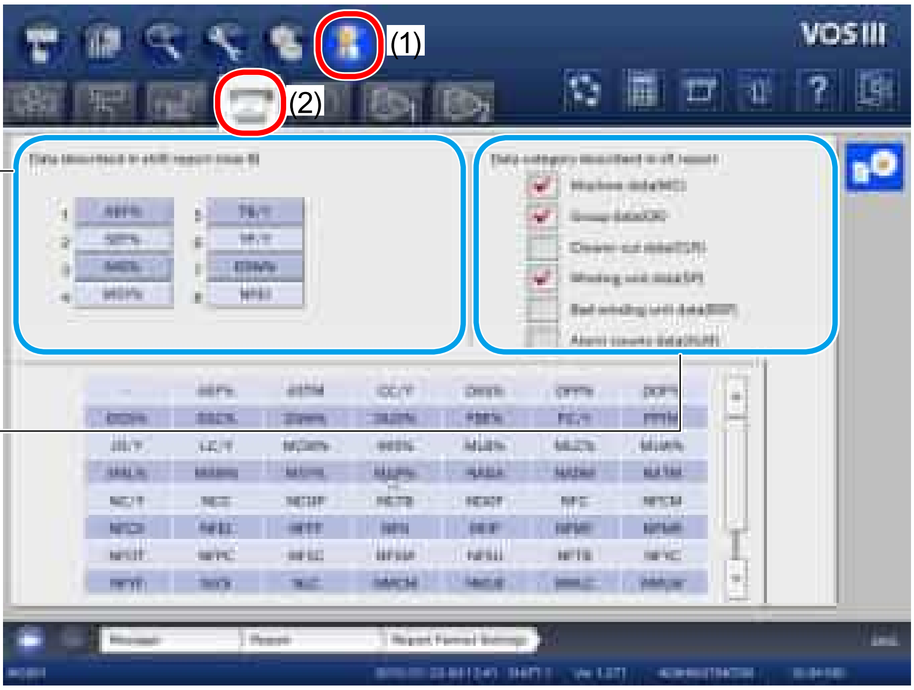
The data written in the shift report can be saved.

1. **Touch (1) and then (2).**

2. **Select the data written in the shift report from the following list.**

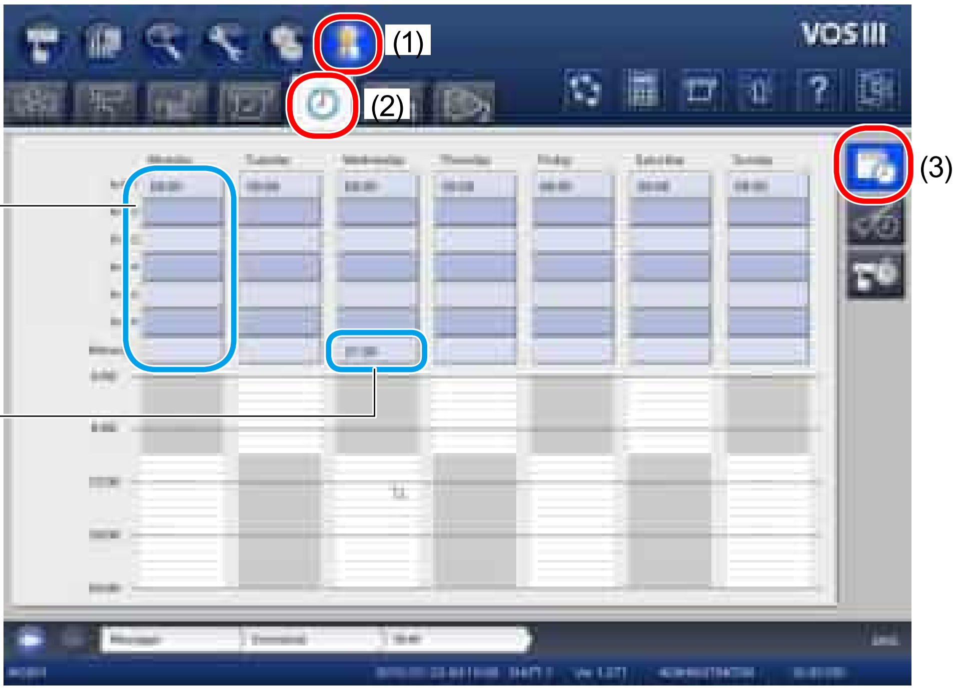
   * The maximum number of items that can be selected is 8.

3. **Select the data category recorded in the shift report.**



<65100> Shift schedule

The shift schedule can be set.



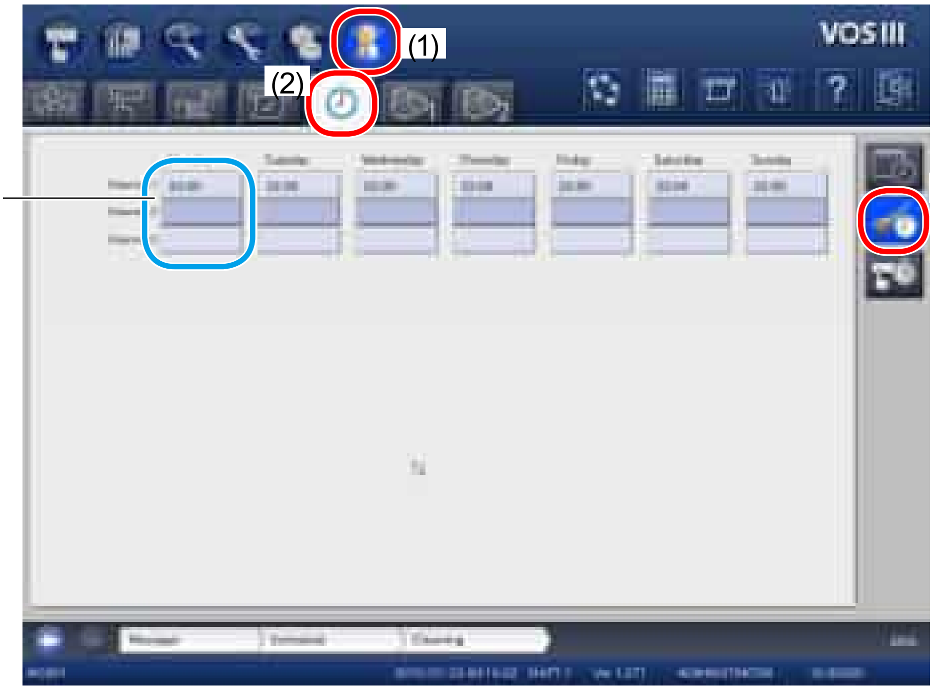
Operation shift time

Manual shift time

Operation shift time	Input the operation shift time. If you input for Monday, then the contents will be copied to all the days. To cancel, input OFF.
Manual shift time	Input the manual shift time when you want to make a special shift change, regardless of the operation shift time.

<65200> Cleaning

The cleaning mode schedule can be set.

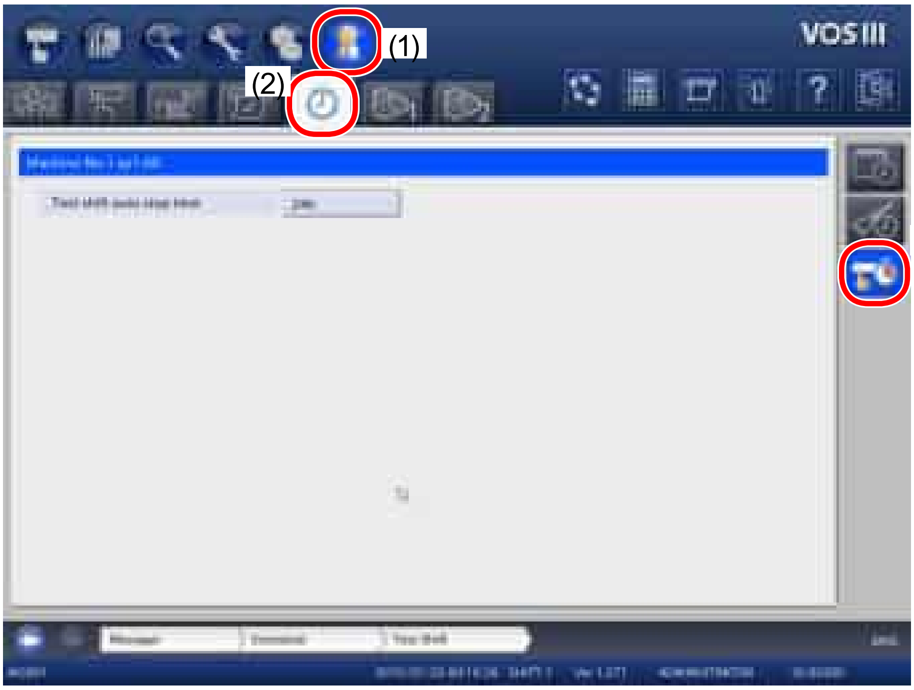


Cleaning mode time

Cleaning mode time	Input the cleaning mode time. If you input for Monday, then the contents will be copied to all the days. To cancel, input OFF.

<65300> Test shift

The test shift time can be set.
When using the test shift function, the test shift will automatically end if the set time has elapsed.



<66110 - 66150> Lot batch settings 1 - package (production)

You can perform all settings for package production in one batch for all lots.

<66210 - 66270> Lot batch settings 1 - package (quality)

You can perform all settings for the package quality in one batch for all lots.

<66310 - 66340> Lot batch settings 1 - unit alarm

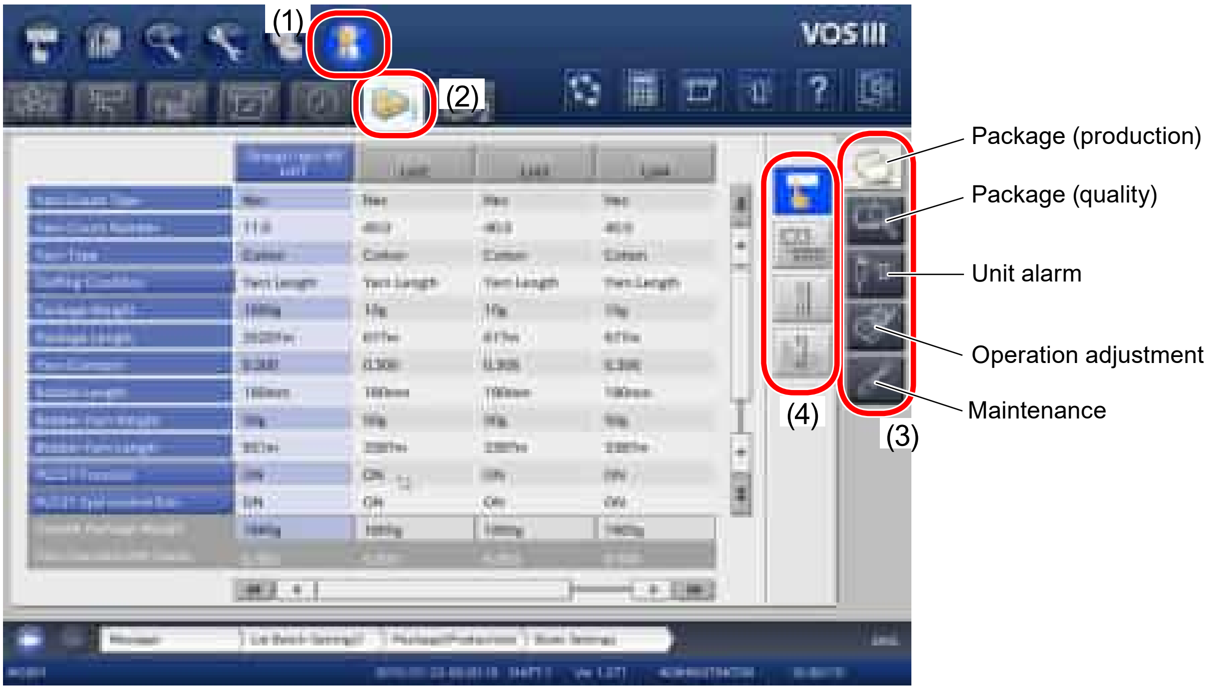
You can perform all settings for the winding unit’s alarms in one batch for all lots.

<66400 - 66420> Lot batch settings 1 - operation adjustment

You can perform all settings for each device inside the winding unit in one batch for all lots.

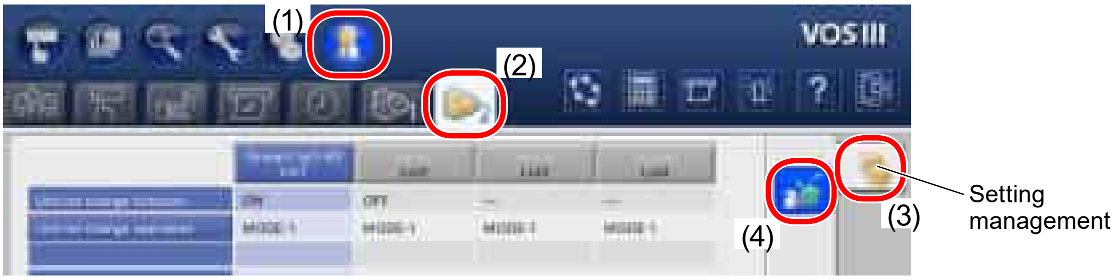
<66510> Lot batch settings 1 - maintenance

You can perform all maintenance settings in one batch for all lots.


(1)
VOS III
(2)
Package (production)
Package (quality)
Unit alarm
Operation adjustment
Maintenance
(4)
(3)

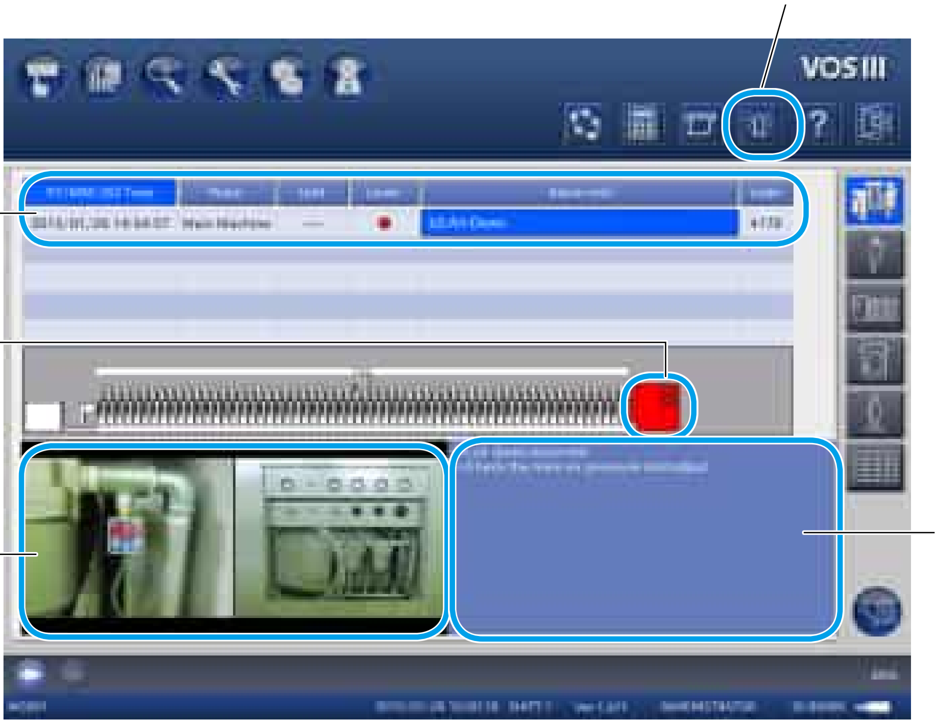
<67110> Lot batch settings 2 - setting maintenance

The items in the setting management can be configured in one batch for all lots.


(1)
VOS III
(2)
Setting
management
(4)
(3)

Sec 9 Alarm screens

The alarm screen displays a current list of alarms that have occurred. The details of each alarm and the support method are displayed with pictures.



Alarm icon
* Switches to the alarm screen.
(Icon flashes red when alarm occurs)

Current list of alarms that have occurred

Location of alarm (highlighted in red)

Picture of alarm location

Comment providing alarm details and support method

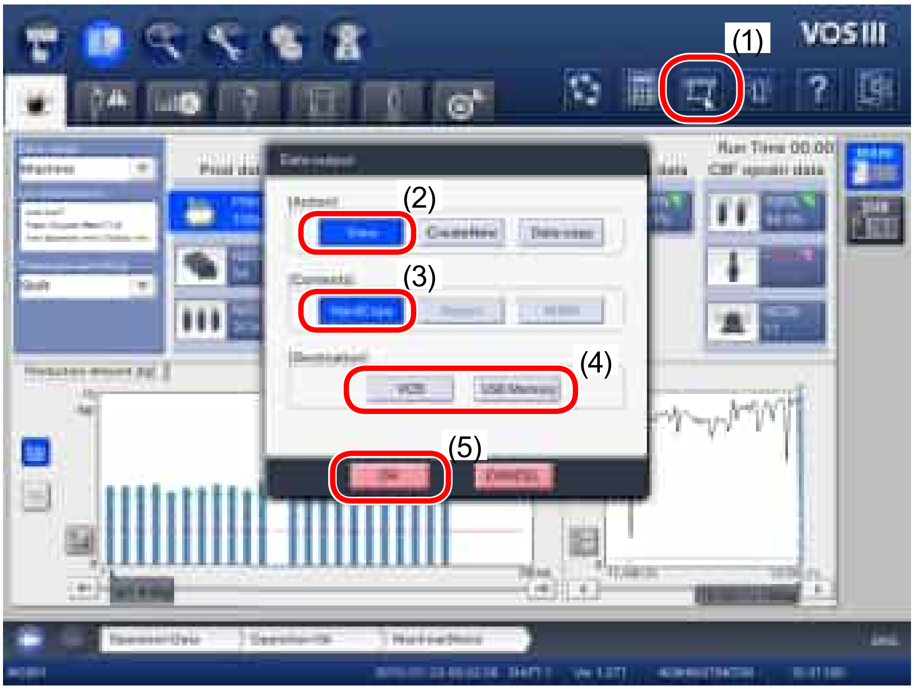
Sec 10 Data output

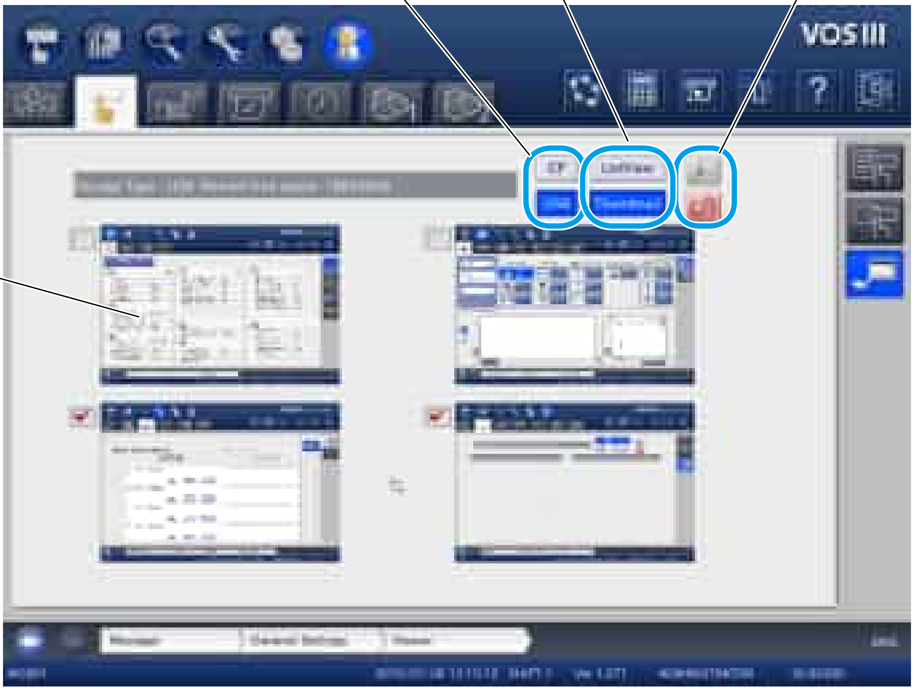
Various data can be retrieved and output as a report, as a hard copy of the screenshot or as MMD data.
In addition, various data can be output to a USB memory or can be reviewed as a hard copy screenshot.

Viewer

Display the hard copy screenshot in VOS.

1. **Set up the USB memory and link it with the VOS.**
2. **Display the VOS screen to be output to the Viewer screen.**
3. **Touch (1), (2) and then (3).**
4. **Select the destination (4) for the VOS data to be displayed.**
5. **Touch the OK button (5).**
   Change to the Viewer screen.


VOS III
(1)
Data output
(2)
(3)
(4)
VOS
USB Memory
(5)
OK
CANCEL
Run Time 00:00
CBF update data



Change the destination for the image data

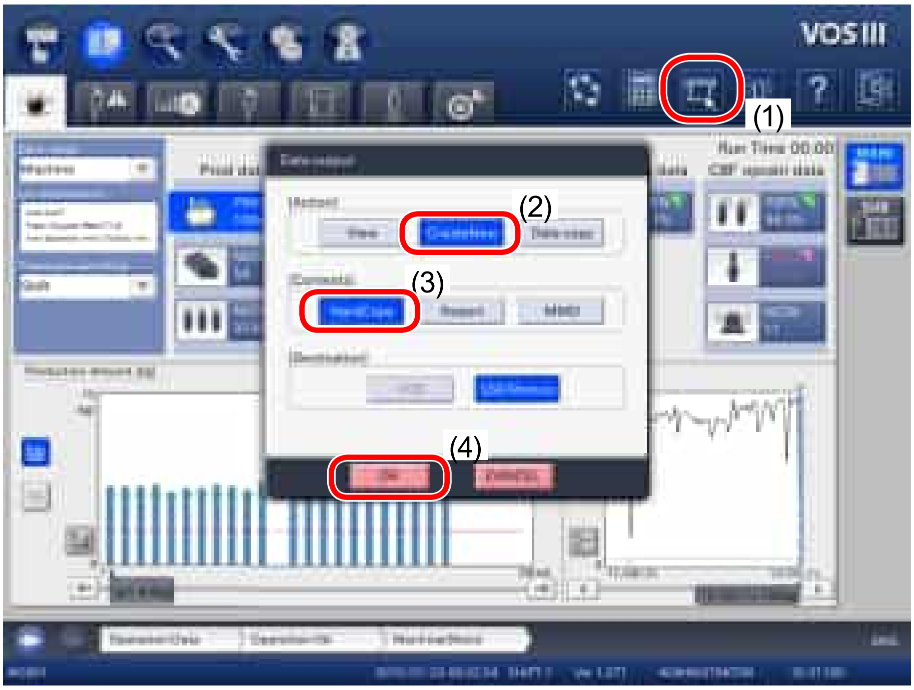
Select either list or thumbnail display for the images

Images with a check can be displayed in full screen or deleted

Touch the image to display in full screen

Hard copy

1. **Set up the USB memory and link it with the VOS.**
2. **Display the VOS screen for the data to be output.**
3. **Touch (1), (2) and then (3) in order.**
4. **Touch the OK button (4).**
   A hard copy screenshot of the VOS screen is created.

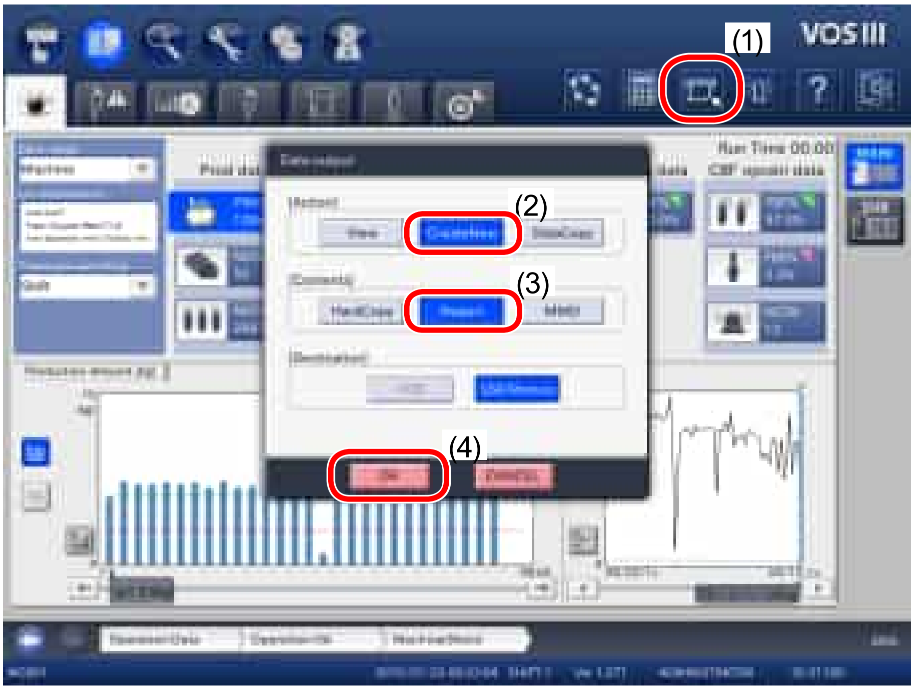


Report

1. **Set up the USB memory and link it with the VOS.**

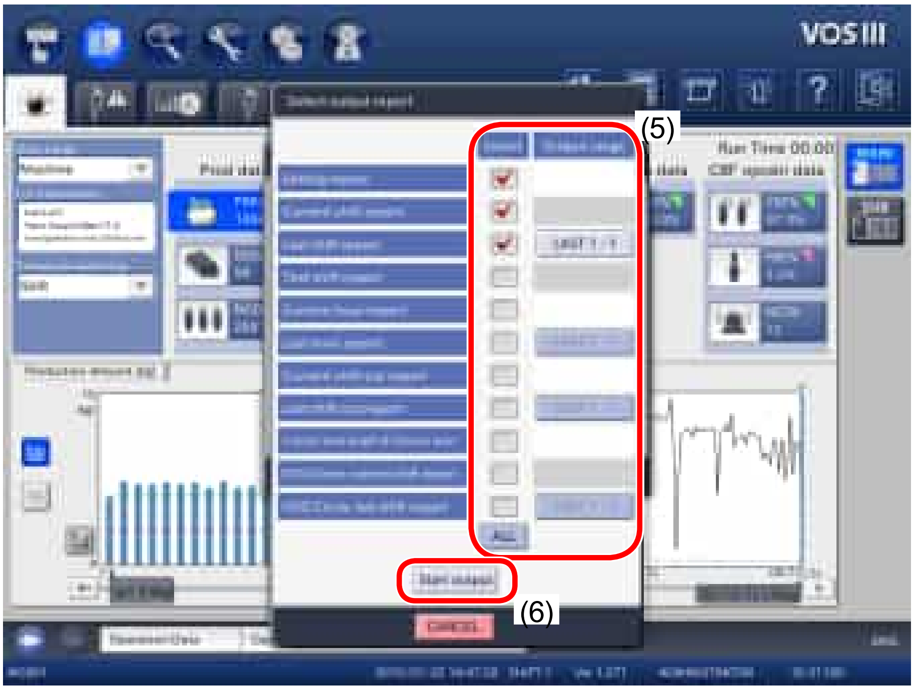
2. **Touch (1), (2) and then (3).**

3. **Touch the OK button (4).** A screen is displayed for selecting the data to be output as a report.



4. **Select the report and shift number (5) to be output.**

5. **Touch the output button (6).** The data is created and saved to the USB memory.



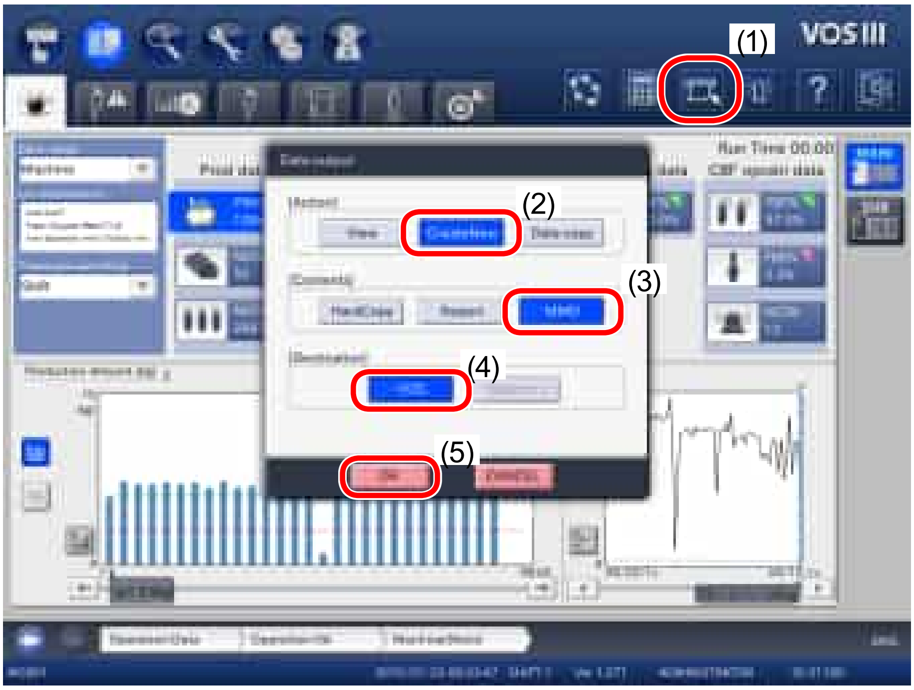
MMD

1. **Touch (1), (2) and then (3).**

2. **Touch the VOS button (4).**

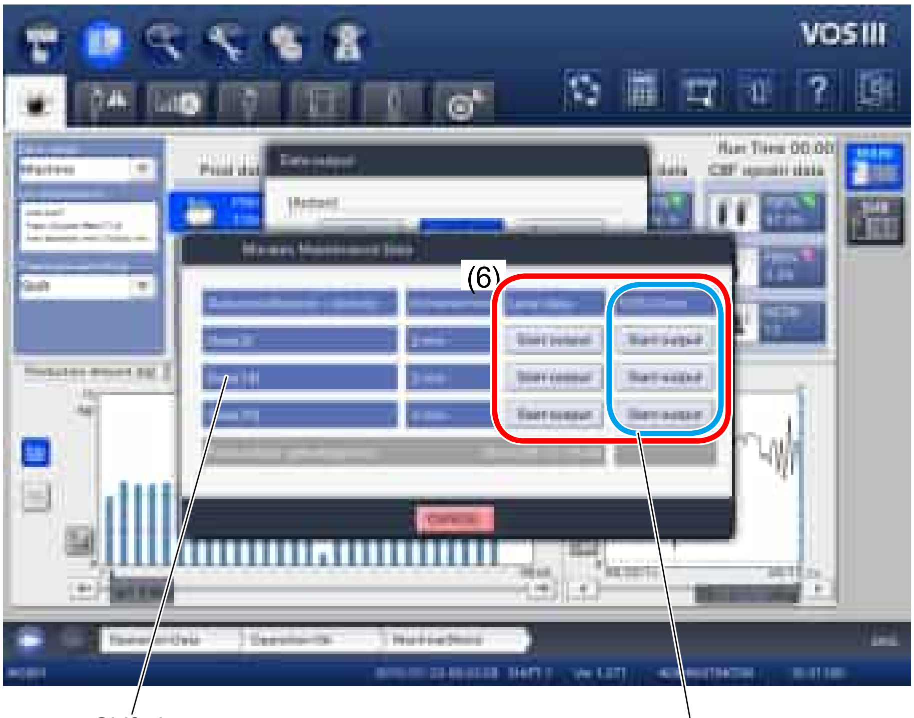
   * When MMD is selected, only the VOS can be selected.

3. **Touch the OK button (5).**
   A screen is displayed for selecting the shift number to be output in MMD.



4. **Touch the output button (6) for the shift data to be created.**
   The data is created and saved to the VOS.

   * When the VOS Circle is ON, the MMD data can be created all at once for the VOS in the same VOS Circle group.



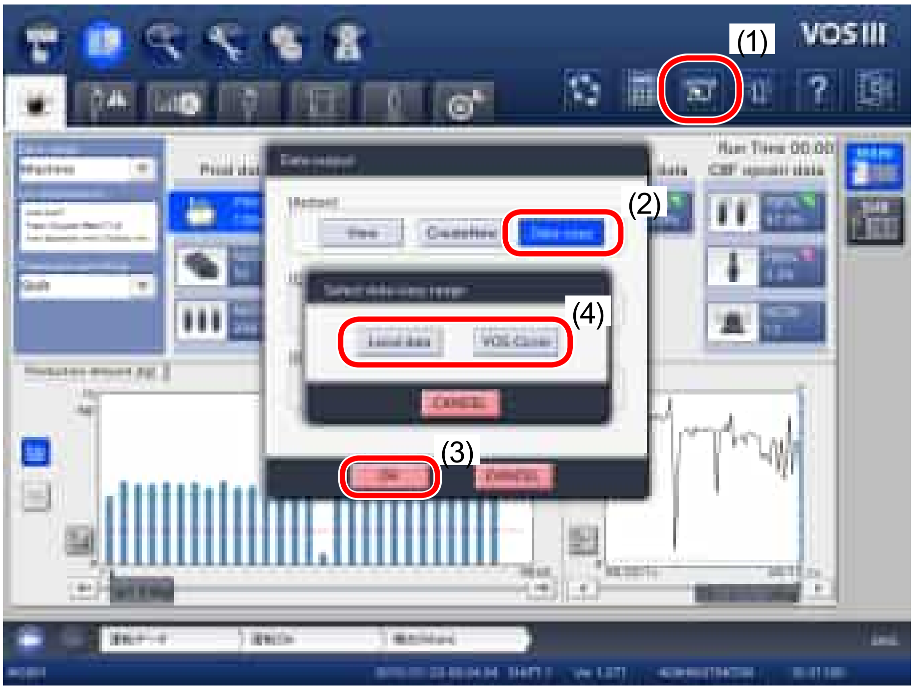
Shift data

When the VOS Circle is OFF, this does not display.

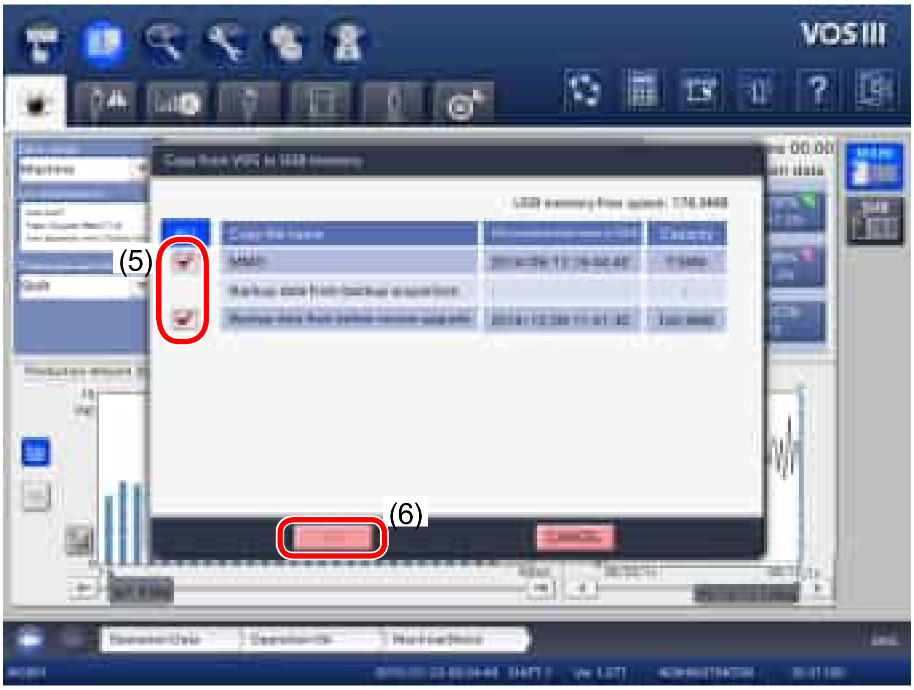
Data copy

MMD data, backup files and other data saved inside the VOS can be output to the USB memory.

1. **Set up the USB memory and link it with the VOS.**
2. **Touch (1) and then (2).**
   * If Data Copy is selected, then only the USB memory can be selected.
3. **Touch the OK button (3).**
   A popup window is displayed for selecting the copy range.
4. **Select the data copy range (4).**
   * When the VOS Circle is OFF, this does not display.



5. **Select the data to be copied (5).**
6. **Touch the OK button (6).**
   The data is copied.



Sec 11 VOS Circle

The operation data between machines can be displayed, and the lots between machines can be copied.

11-1 VOS Circle settings

The IP address, subnet mask, machine No. and VOS Circle machine group number can all be set from the screen ID <62100>. Refer to <62100> Initial Settings> in Section 8 for details.

11-2 Operation data

<E1100> Machine

Displays the operation data for each machine.

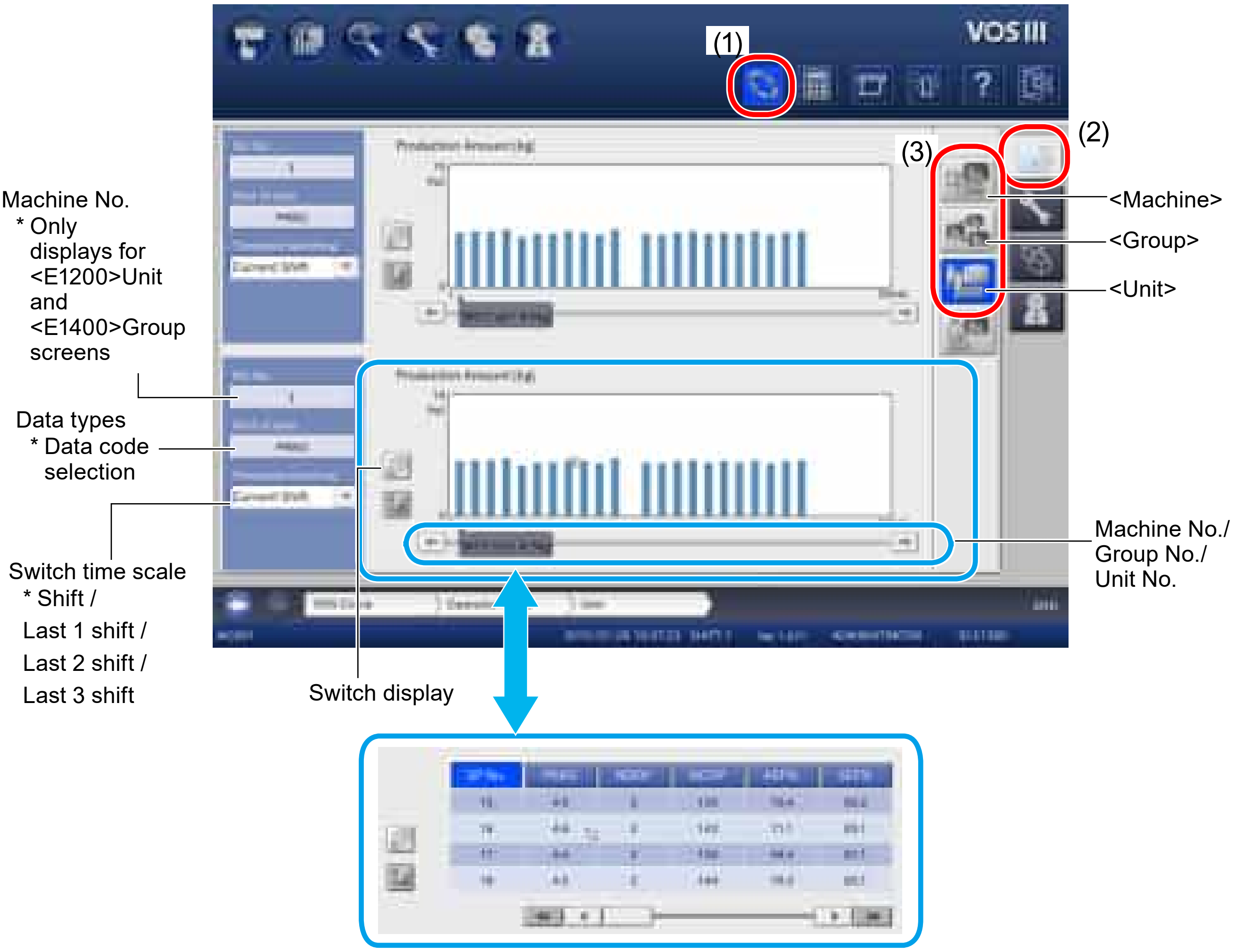
<E1400> Group

Displays the operation data for each group inside the machine.

<E1200> Unit

Displays the operation data for each winding unit inside the machine.

- **After touching (1) and (2) in order, touch and select one of the icons from (3).**

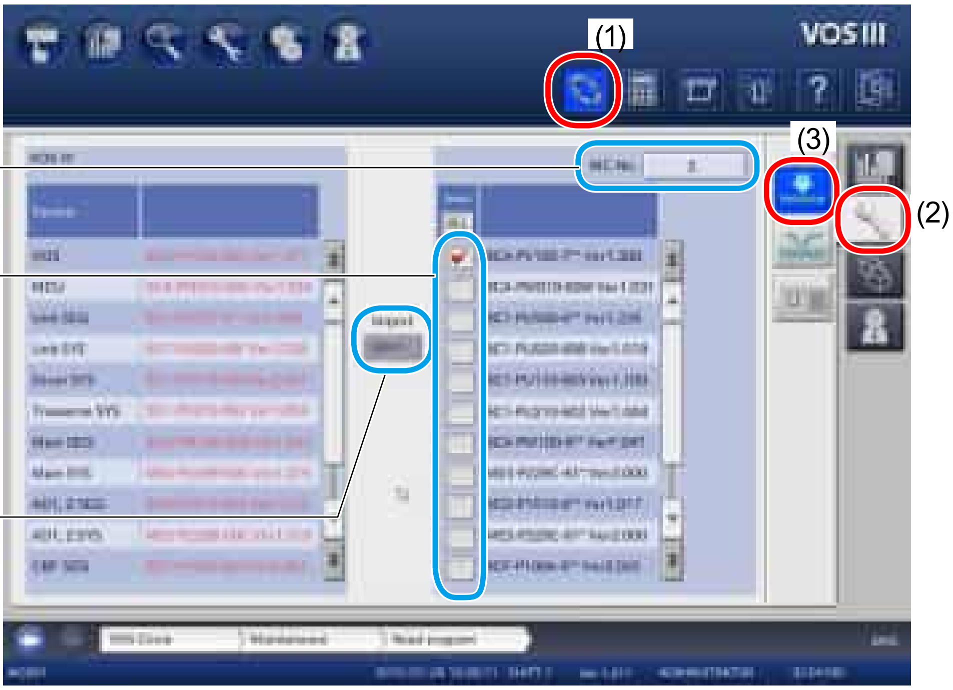

VOS III
(1)
(2)
(3)
<Machine>
<Group>
<Unit>
Machine No.
* Only displays for <E1200>Unit and <E1400>Group screens
Data types
* Data code selection
Switch time scale
* Shift /
Last 1 shift /
Last 2 shift /
Last 3 shift
Switch display
Machine No./
Group No./
Unit No.

11-3 Maintenance

<E4100> Read program

Device programs for other machines can be read.

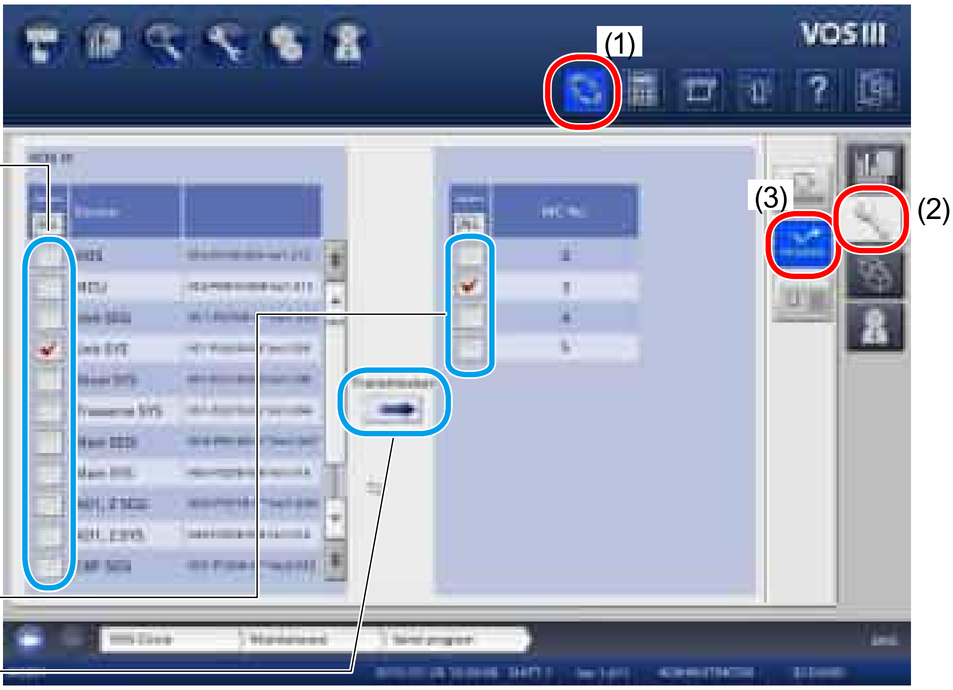
1. **Touch (1), (2) and then (3).**
2. **Input the machine No.**
3. **Touch the check box of the program that you want to read.**
   Multiple programs can be selected.
4. **Touch “Import.”**



<E4200> Send program

A device program can be sent to other machines.

1. **Touch (1), (2) and then (3).**
2. **Touch the check box of the program that you want to send.**
   Multiple programs can be selected.
3. **Touch the check box for the machine No. where you are sending.**
   Multiple machines can be selected.
4. **Touch “Transmission.”**

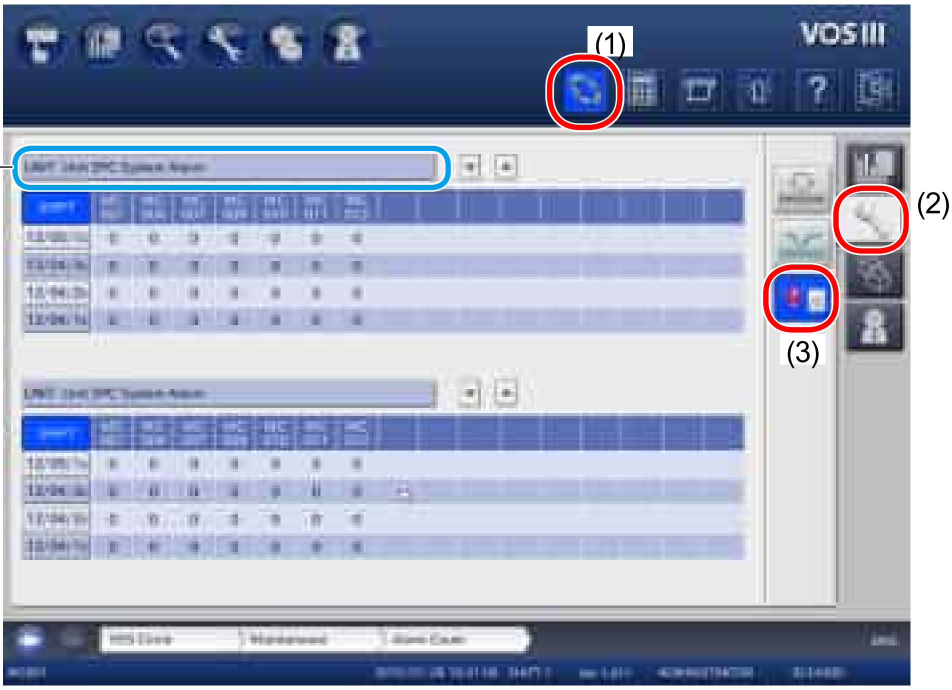


<E4300> Alarm summary

The number of alarms on each machine is displayed.

1. **Touch (1), (2) and then (3).**

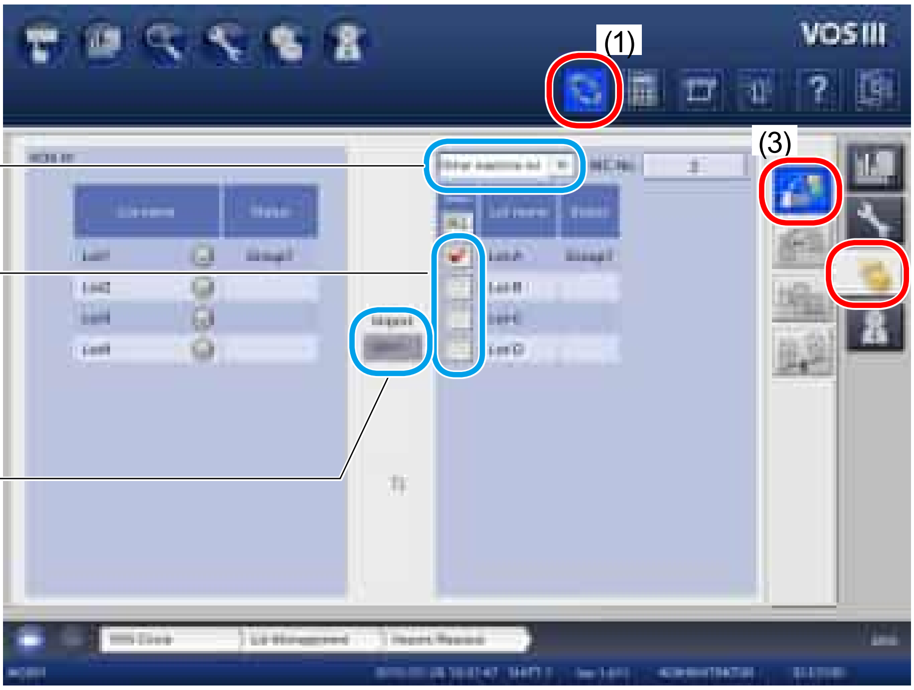
2. **Select the device and the alarm name that you want to check.**



<E3100> Import / request

The lot set on other machines can be imported or imported as requested.

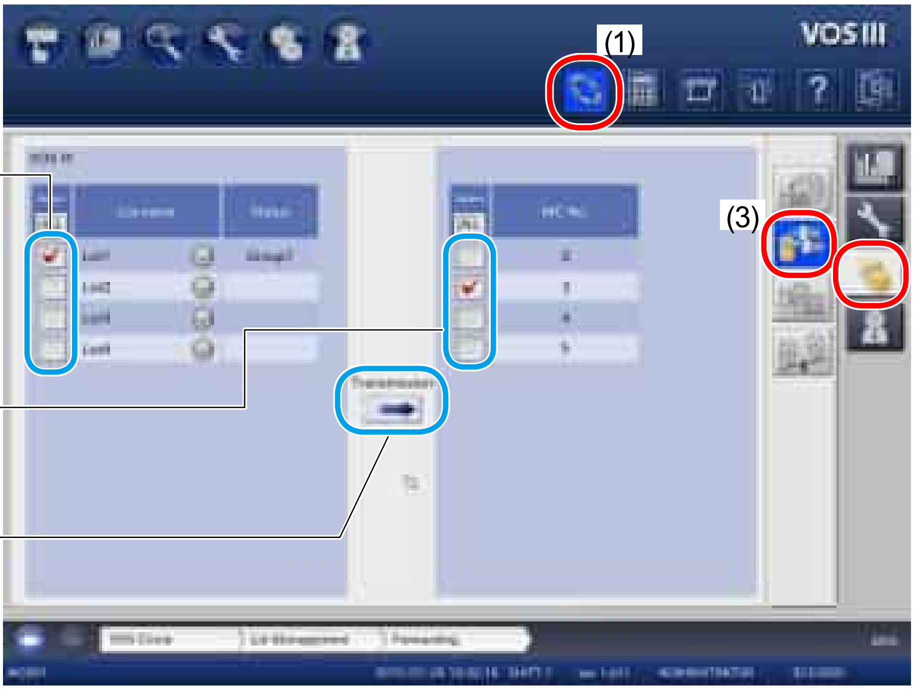
1. **Touch (1), (2) and then (3).**
2. **Select "Other machine lot" or "Received lot."** (Enter the machine No. only when "Other machine lot" is selected.)
3. **Touch the check box of the lot that you want to import.** Multiple lots can be selected.
4. **Touch "Import."**



<E3200> Forwarding

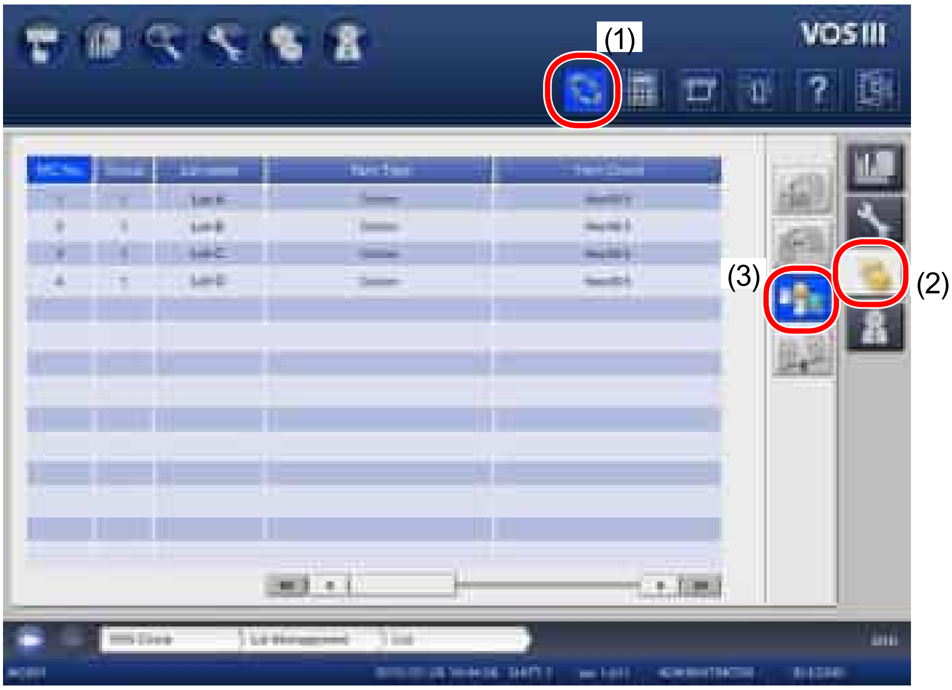
The set lot can be forwarded to other machines.

1. **Touch (1), (2) and then (3).**
2. **Touch the check box of the lot that you want to send.** Multiple lots can be selected.
3. **Touch the check box for the machine No. where you are sending.** Multiple machines can be selected.
4. **Touch "Transmission."**



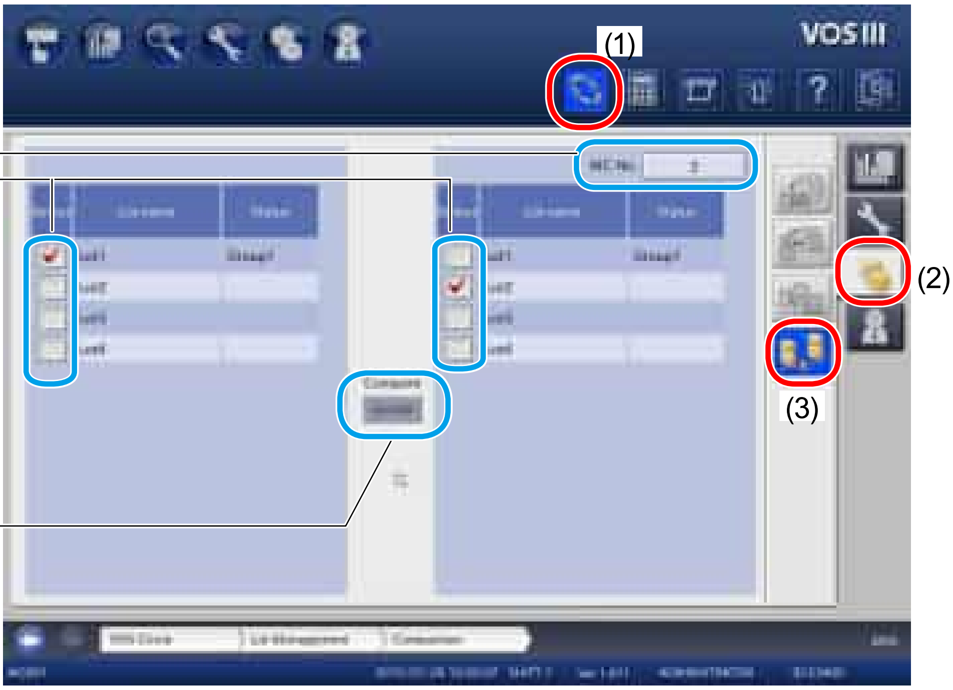
<E3300> List

A list of lots being used for machine operation is displayed.



<E3400> Comparison

A comparison of lot settings is displayed.



1. **Touch (1), (2) and then (3).**
2. **Input the machine No.**
3. **Touch the check box of the lot that you want to compare.**
4. **Touch “Cmpare.”**

11-5 Manager

<E5100> Report format settings

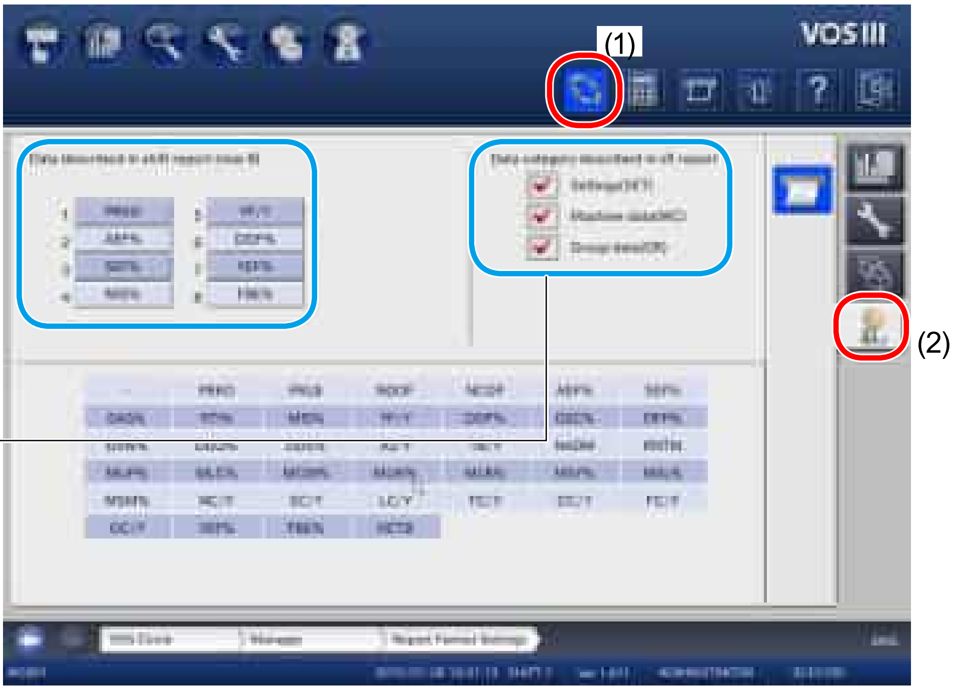
The data written in the VOS Circle shift report can be selected.

1. **Touch (1) and then (2).**

2. **The data written in the VOS Circle shift report can be selected from the list below.**

   * The maximum number of items that can be selected is 8.

3. **Select the category of the data that is written in the VOS Circle shift report.**

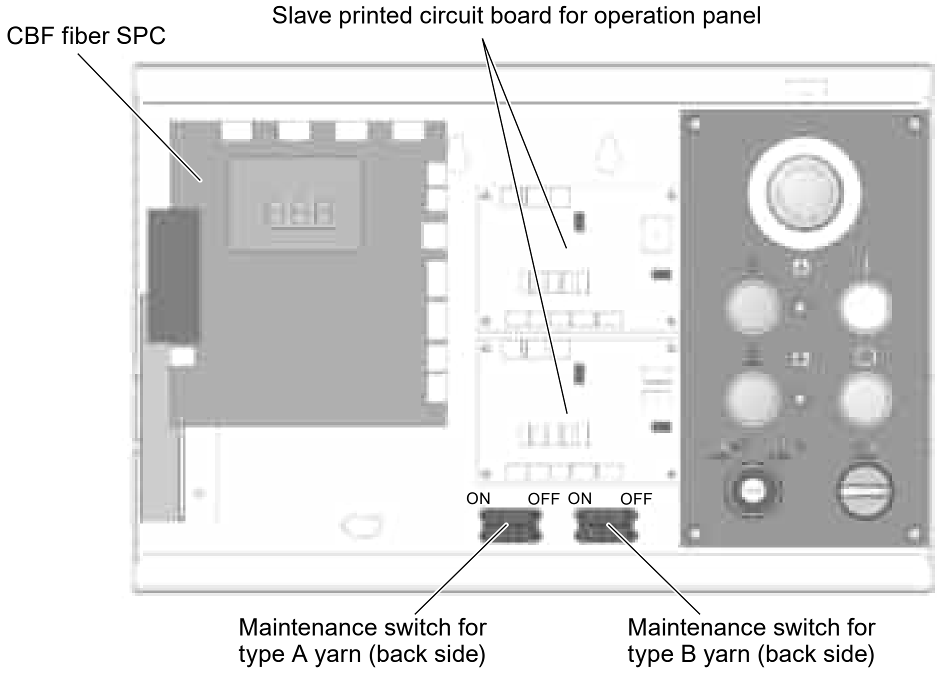


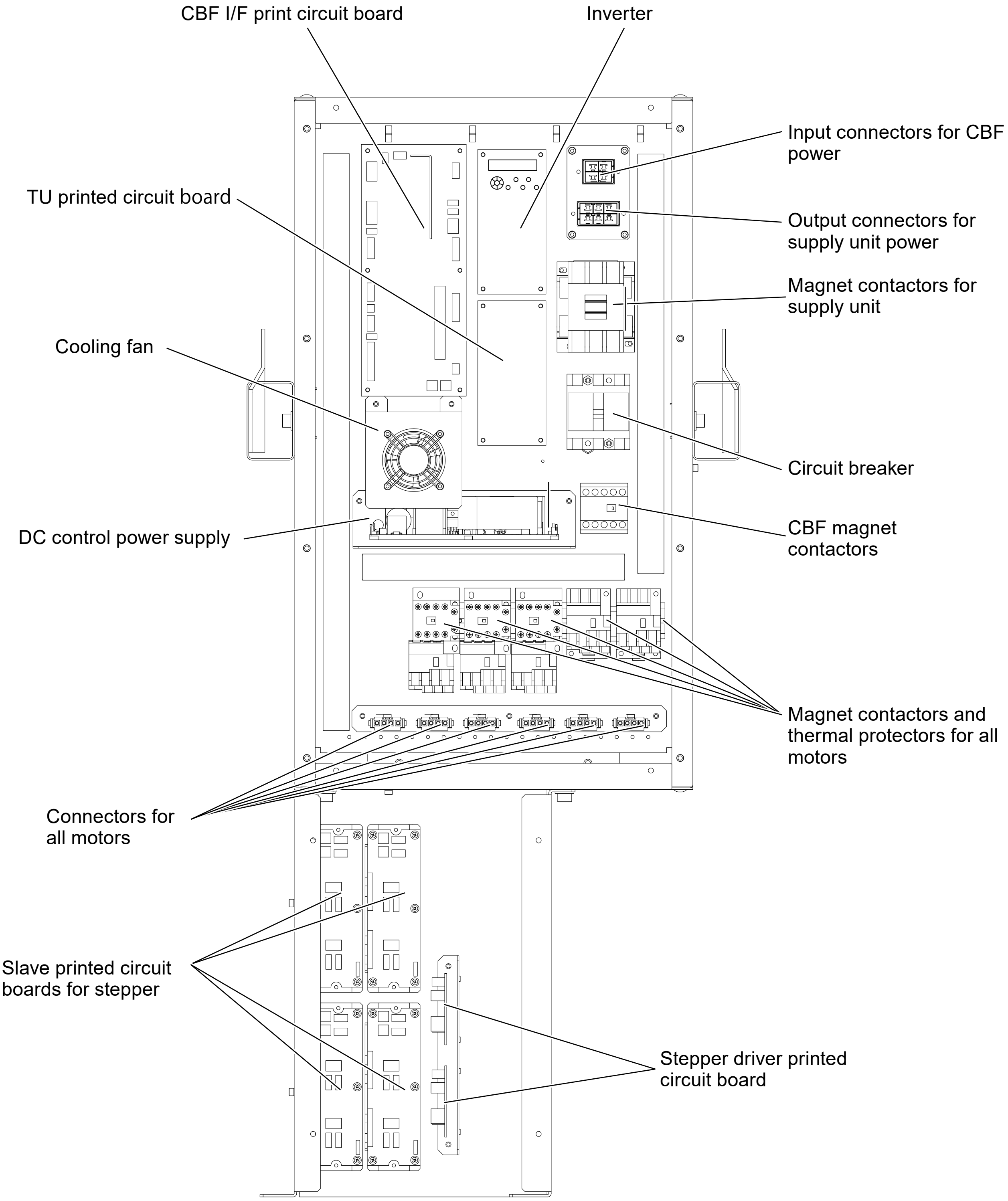
muratec

Chapter 8A Operation Method

Sec 1 Layout of Electrical Equipment

1-1 Operation Panel


CBF fiber SPC
Slave printed circuit board for operation panel
ON
OFF
ON
OFF
Maintenance switch for type A yarn (back side)
Maintenance switch for type B yarn (back side)


CBF I/F print circuit board
Inverter
Input connectors for CBF power
TU printed circuit board
Output connectors for supply unit power
Magnet contactors for supply unit
Cooling fan
Circuit breaker
DC control power supply
CBF magnet contactors
Magnet contactors and thermal protectors for all motors
Connectors for all motors
Slave printed circuit boards for stepper
Stepper driver printed circuit board

Sec 2 Operation Settings

2-1 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

[CBF basic settings]

CBF Startup Mode Setting	Set CBF startup mode
Bad Bobbin Auto Removal	---
A Line (Unit) Range	Set group(s) for winding units on line A
B Line (Unit) Range	Set group(s) for winding units on line B
Yarn Type	Set yarn type for each line
Twist Drctn	Set twist direction for each line
Bobbin Bunch	Set bobbin bunch position
No.of AutoFedBobs-Byps	Set number of bobbins that can be held on bypass line * When set to “0,” if 8 or more bobbins build up on bypass line, operator call occurs. * When 3 or more empty bobbins build up on bypass line, tray is fed automatically regardless of settings.
CBF Lot Change Selection	Set lot change mode for CBF **●MODE-1: Chute bobbin winding mode** This mode is used when all bobbins currently in CBF are to be wound rather than performing another chute operation. - Chute unit: Chute operation is stopped - Yarn end finder: In addition to normal operation, empty trays are supplied to winding unit - Ejector: Normal operation **●MODE-2: Automatic ejection mode** In this mode, all bobbins are rotated in CBF and ejected by bobbin ejector. Then empty trays are supplied to winding unit. This mode is used when bobbins in CBF need to be automatically ejected. - Chute unit: Chute operation continues until supply unit is empty - Yarn end finder: Yarn end finding operation is not performed, and all trays except empty ones are supplied to bypass line - Ejector: All bobbins are ejected **●MODE-3: All bobbins under unit ejection mode** All bobbins returning from winding unit are ejected rather than performing another chute operation. - Chute unit: Chute operation is stopped - Yarn end finder: Yarn end finding operation is not performed, and all trays except empty ones are supplied to bypass line - Ejector: All bobbins are ejected **●MODE-4: Supplied bobbin winding mode** This mode is used when all bobbins, including ones in the supply unit (parts feeder, etc.), are fully wound - Chute unit: Chute operation continues until supply unit is empty - Yarn end finder: In addition to normal operation, empty trays are supplied to winding unit - Ejector: Normal operation
Return Conveyor Reverse Cycle	Return conveyor reverse cycle time setting *Will carry out continuous operation in forward rotation when set to OFF.

[Yarn end finder]

YarnEndFinder Spd Setup	Set feed time for yarn end finder to one of three levels
No. of YEF Attempts	Set Cop-Robo yarn end finder search count
Yarn Holding Lever Setup	Set yarn holding lever motion at mouth
Suction Shutter Open Tm	Set head suction shutter release time
Mouth Lowering Time	Set Cop-Robo mouth lowering time
Shutter Cutter Timing	Set timing to close shutter's cutter after successfully detecting the yarn end with Cop-Robo
VORTEX Motion Setup	Set VORTEX blast pattern
Tray Rotation for Top Bunch	Set rotation amount of tray for top bunch
Searcher Operating Time	Set searcher operation time
Tray Rotation for Side Suction	Set rotation amount of tray when unwinding yarn on the side suction
Tray Reverse Rotation for Side Suction	Set rotation amount of tray when winding yarn on the side suction
Beater Motion Setup	Set motion mode for beater
Beater On Delay Time	Set beater ON delay time
R.Cutter Operating Time	Set operation time for rotary cutter
YEF Detection Forced On	When turned ON, this setting assumes yarn end was found for all bobbins (regardless of yarn end detection sensor activity) and they are supplied to winding unit
Slub Yarn Function	This function is used to prevent malfunction due to slab yarn being pulled apart. The detection time for the yarn end detection sensor is extended at yarn end finder (YEF).
YEF Yarn End Removal	Cop-Robo takes up and removes yarn waste from bobbin at end of winding operation for preset duration. When turned ON, the yarn end is taken up and removed for preset duration, after yarn end is found and while shutter's cutter is kept open without yarn holding lever pressing bobbin.
YEF Yarn End Remov. Time	Set take-up time for YEF yarn end
Feed C/V Dischge Delay	When turned ON, tray feed in front of rotary cutter position is controlled so that only one bobbin is supplied to rotary cutter position

[Bobbin stripper]

StripperThroughputSetup	Set capacity for bobbin processing to one of the four levels
Bobbin Stripper Clamp	Set bobbin stripper clamp count
Stripper Clamp Time	Set base time for clamp
Stripper Clamp Add. Time	Set amount of time to be added per clamp count
Bobbin Stripper Cutter	Enable or disable bobbin stripper cutter, and set its frequency of operation

[Bobbin ejector]

Ejector Motion Setup	Set bobbin ejector settings - Empty B Only: (Empty Bobbins Only) Only empty bobbins and skinny bobbins are ejected - Eject all B: (Eject All Bobbins) All bobbins are ejected - 2disch/3min: All Eject: When bypass line performs two automatic ejections within three minutes, all bobbins are ejected when bobbins are fed from bypass. For bobbins other than said condition (not from bypass), only empty bobbins and skinny bobbins are ejected. - All (Bypass): Eject all bobbins that are fed from bypass line. For bobbins other than said condition (not from bypass), only empty bobbins and skinny bobbins are ejected.
Ejector/SupplyUnit Setup	Set capacity of bobbin ejector and bobbin supply unit processing to one of four levels
Ejector Discharge Setup	When turned ON, all bobbins removed by bobbin ejector are assumed to be skinny bobbins and they are automatically fed (forced) to skinny bobbin side on ejector

[Supply part]

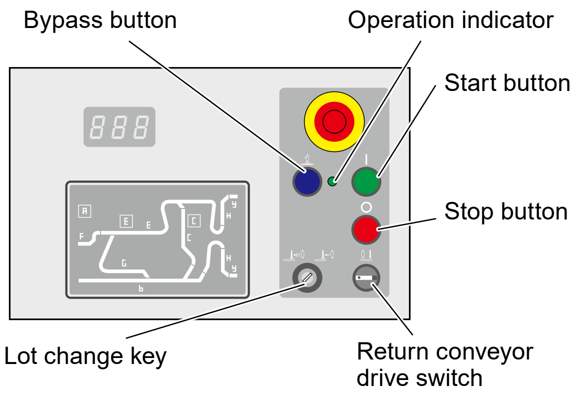
BR - No. of mouth actions	Set the number of mouth actions for the bunch remover
BR - Mouth operation time	Set the mouth operation time for the bunch remover
BR - Suction time	Set the suction operation time for the bunch remover

[Spin inspector]

Bad Bobbin Auto Removal	Turn ON (when using spin inspector specification) - Defective bobbins ejected from the winding unit are transported to separate line for inspection

Sec 3 Switch Operation

* Refer to Chapter 8G for details on the hoist switch operations.



3-1 Startup

Starting the Winder

The winder must be started before operating the CBF.

1. **Turn ON the winder main switch and press the start button on the winder operation panel.**

CAUTION

If you select the CBF startup mode for starting it together with the winder on the VOS screen (initial settings), the CBF will start automatically. Therefore, always make sure that the CBF is safe and secure before you press the winder start button.

Starting the CBF

* When “Manual Start” is set on the VOS screen

1. **Press the start button on the CBF operation panel while the winder is operating.**
   The CBF will start automatic operation.

3-2 Stoppage

Stopping the CBF

1. **Press the stop button on the CBF operation panel.**
   Press this button to temporarily stop the CBF only.

Stopping the Winder

1. **Press the stop button on the winder operation panel.**
2. **Turn OFF the winder main switch.**

* To stop the winder and the CBF simultaneously, press the stop button on the winder operation panel.

CAUTION

When using an AD (Auto Doffer) specification, the AD finishes operation within a certain period of time after pressing the stop button on the winder switch panel.
Therefore, press the stop button, and wait for at least 20 seconds, before turning OFF the winder main switch.

3-3 Feeding Bobbins from the Bypass Line

Starting the Winder

1. **Press the bypass button on the CBF operation panel.**
   The bobbins currently waiting on bypass line are fed, regardless of the bobbin number setting for automatic bypass feeding.

3-4 Return Conveyor Drive Switch

Starting the Conveyor

1. **Turn ON the drive switch and press the start button on the winder operation panel.**

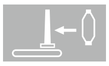
Stopping the Conveyor

1. **Turn OFF the drive switch.**

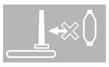
* This switch is used for cleaning and performing machine maintenance.

3-5 Lot Change Key Switch

Turning ON the lot change key engages the machine into lot change mode.
The lot change key operation varies depending on the VOS settings. Refer to Chapter 7 for operation details.



: Switch during normal operation.



: Switch during lot change.

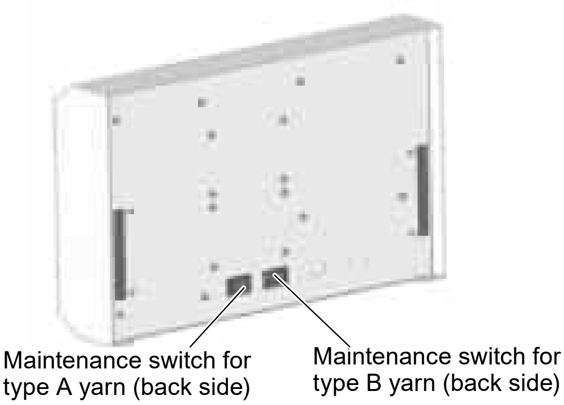
3-6 Maintenance Switch

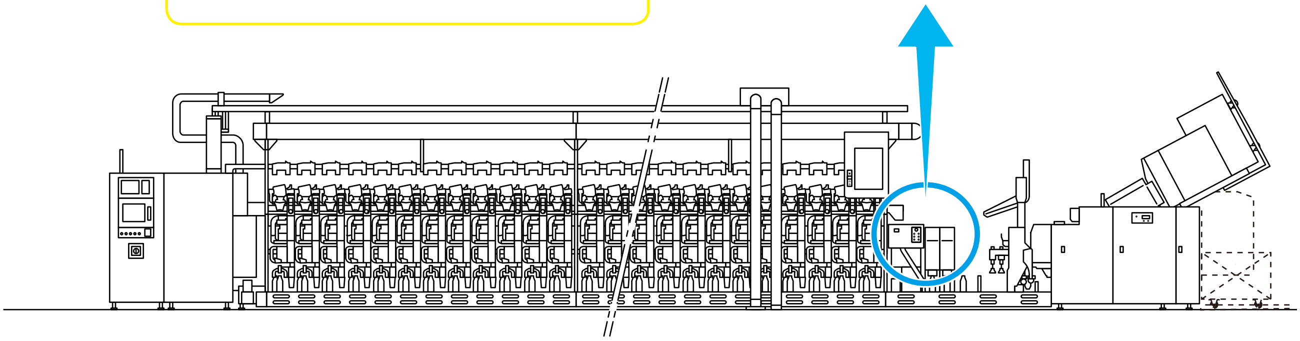
Turning ON the maintenance switch, located on the back of the CBF operation panel, engages the machine into maintenance mode.

- * The operation indicator flashes when engaged in maintenance mode.
- * The CBF does not operate when engaged in maintenance mode even if the start button is pressed.
  This switch is used for cleaning and performing machine maintenance.
- * To restart, turn OFF the switch and press the start button.

CAUTION

If the operation indicator (green LED) is flashing without the CBF starting, ensure that the maintenance switch is not turned ON.


Maintenance switch for type A yarn (back side)
Maintenance switch for type B yarn (back side)



Sec 4 Emergency Stop

Emergency Stop Operations

If it is necessary to stop the winder immediately to avoid injury or further machine damage, use one of the following switches to bring all operations on the machine to an immediate stop.

- **Press the emergency stop switch on the CBF operation panel**

[When restarting operation]

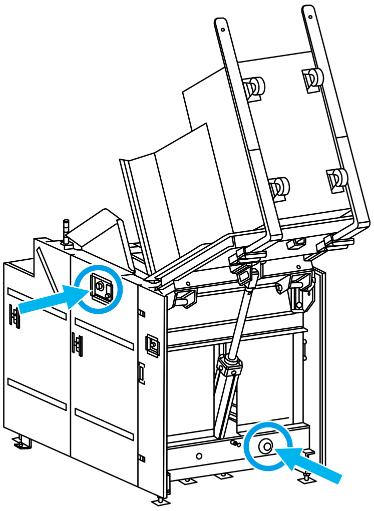
1. **Turn the locked emergency stop switch to the right to release.**
2. **Press the start button on the machine operation panel.**

- **Turn OFF the main switch.**

[When restarting operation]

1. **Turn ON the machine main switch.**
2. **Press the start button on the machine operation panel.**

- **Press the emergency stop switch on the hoist (Only when using a parts feeder specification)**
  - Side operation panel
  - Lower section of hoist



[When restarting operation]

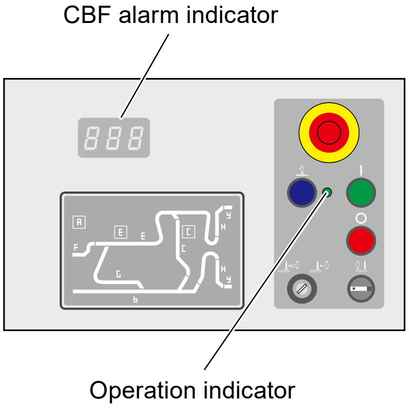
1. **Turn the locked emergency stop switch to the right to release.**
2. **Press the start button on the machine operation panel.**

CAUTION

Bringing the machine to a stop in the middle of an operation will cause the machine to overload. Do not use the emergency stop switch unnecessarily, or unless it is an emergency.

Sec 5 Indicator Display

CBF Operation Panel



- **Operation indicator (green LED)**

Lit	CBF in operation
Flashing (2 second intervals)	Engaged in maintenance mode
Flashing (1 second intervals)	Bobbin removed at Cop-Robo

- **CBF alarm indicator**
  An alarm code number will appear in the 7-segment display (3 digits) on the CBF fiber SPC.

Signal Tower on Main Control Box

[Link Coner]

	Lit	Flashing
Red	- CBF error - Feed conveyor tray jammed - Steam setter problem	Emergency stop (2 second intervals)
Yellow	Waiting for spinning-bobbins from the spinning frame	- Bypass line is full, or eight bobbins are waiting with automatic feed from bypass line turned OFF (0.2 second intervals) - Spinning frame problem (2 second intervals) - Inspector conveyor full (0.2 second intervals) (for spin inspector specification only)
Green	Operating	---

[Bobbin Tray]

	Lit	Flashing
Red	- CBF error - Feed conveyor tray jammed	Emergency stop (0.2 second intervals)
Yellow	- Bobbin supply is delayed (Setting available to enable/disable display on VOS) - Parts feeder hoist at top end position (Setting available to enable/disable display on VOS)	Bypass line is full, or eight bobbins are waiting with automatic feed from bypass line turned OFF
Green	Operating	---

Rotating Light at the Winder Out-end (flashing only)

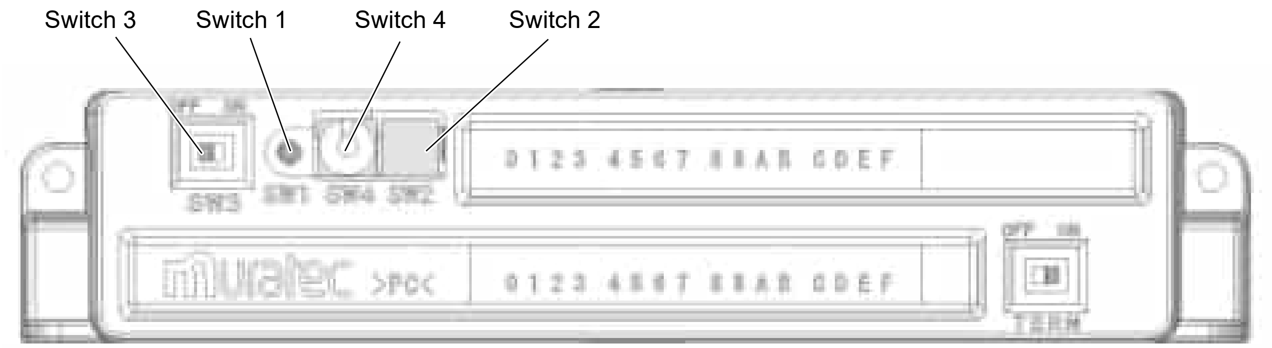
[Link Coner]

	0.2-second intervals	1-second intervals	2-second intervals
Red	- CBF error - Steam setter problem	---	- Spinning frame problem - Emergency stop
Yellow	- Bypass line is full, or eight bobbins are waiting with automatic feed from bypass line turned OFF - Inspector conveyor full (for spin inspector specification only)	---	---

[Bobbin Tray]

	0.2-second intervals	1-second intervals	2-second intervals
Red	CBF error	Bypass line full	Emergency stop
Yellow	- Bypass line is full, or eight bobbins are waiting with automatic feed from bypass line turned OFF - Bobbin supply is delayed (Setting available to enable/disable display on VOS) - Parts feeder hoist at top end position (Setting available to enable/disable display on VOS)	---	---

Sec 6 Input/Output Check Operation



6-1 Input Check

Use the slave I/O to check the input. Check the ON/OFF settings for the corresponding input number.

[Ex:] When X20 is “0,” and X7E is “E”

6-2 Force Output Mode

You can check the output by using the force output mode on the slave printed circuit board.

Remote I/O Slave

When SW3 is turned ON, the slave will engage in force output mode. You can check the output by selecting the locations that you want to check with SW4 (16 locations) and turning SW1 ON.

* Refer to the electrical drawing for details on the output No.

1. **Stop the CBF.**

   * Perform the following procedure on each applicable slave.
2. **Turn SW3 ON.**
3. **Adjust SW4 to the last digit in the device number of the device that needs to be checked.**

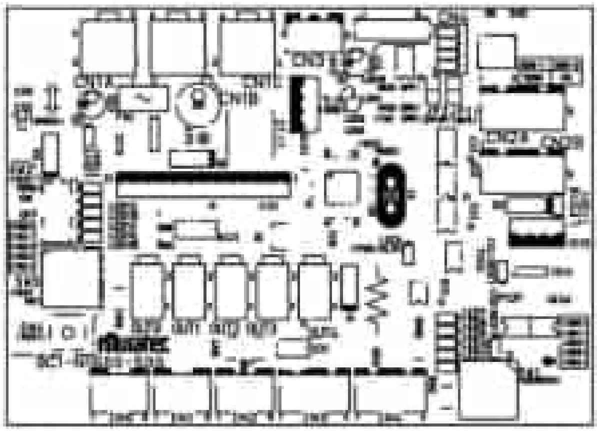
   [Ex:] For Y23A, set to “A,” and for Y261, set to “1”
4. **Turn SW1 ON and check the output.**
5. **After checking, turn SW3 OFF and cancel the output mode.**

   * When SW1 is held down for five seconds or longer, the output status will be maintained. When SW1 is pressed again, the output status will be cancelled.

   * The output status can be maintained at any number of locations at a time.

   * When engaged in force output mode, the CBF alarm indicator will display “– – –.“

Slave I/O 5/5



1. **Stop the CBF.**

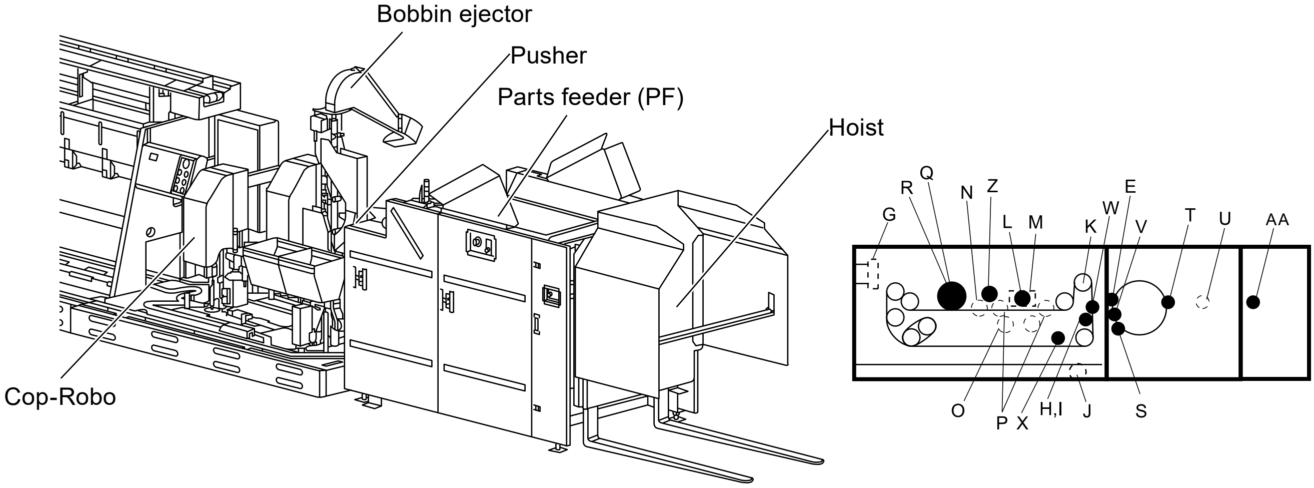
   * Perform the following procedure on each applicable slave.
2. **Turn SW2 ON.**
3. **Adjust SW3 to the last digit in the device number of the device that needs to be checked.**

   [Ex:] For Y23A, set to “A,” and for Y261, set to “1”
4. **Turn SW4 ON and check the output.**
5. **After checking, turn SW2 OFF and cancel the output mode.**

CAUTION

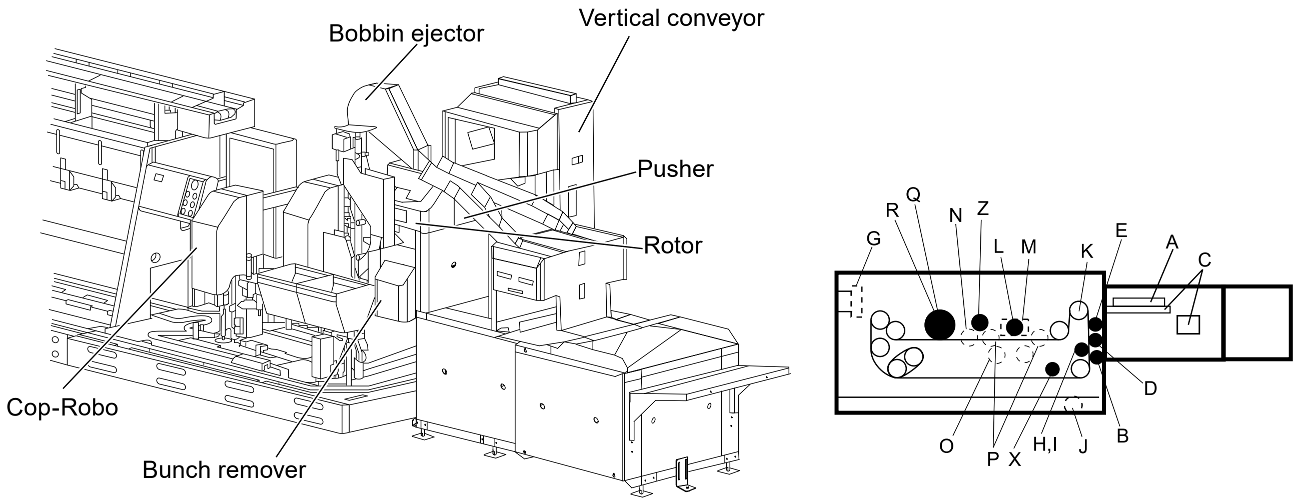
If you switch to force output mode during the CBF operation, the operation will stop.

Sec 1 Maintenance Locations

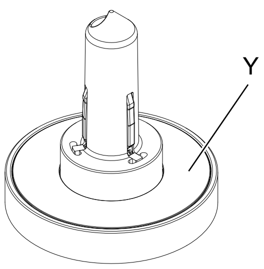

Bobbin ejector
Pusher
Parts feeder (PF)
Hoist
Cop-Robo
R
Q
N
Z
G
L
M
K
E
W
V
T
U
AA
O
P
X
H,I
J
S

* The above diagram shows a Bobbin Tray with hoist (left-hand machine for 1 yarn type).

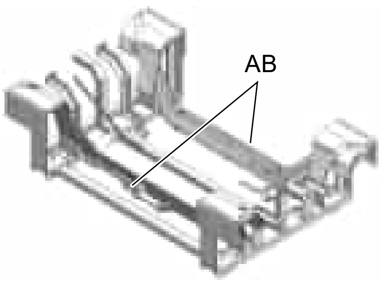
* H, I, S, T, U, V, W are only applicable to the Bobbin Tray.


Bobbin ejector
Vertical conveyor
Pusher
Rotor
Cop-Robo
Bunch remover
R
Q
N
Z
G
L
M
K
E
A
C
D
O
P
X
H,I
J
B

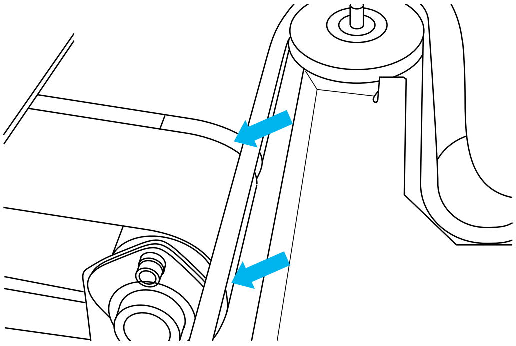
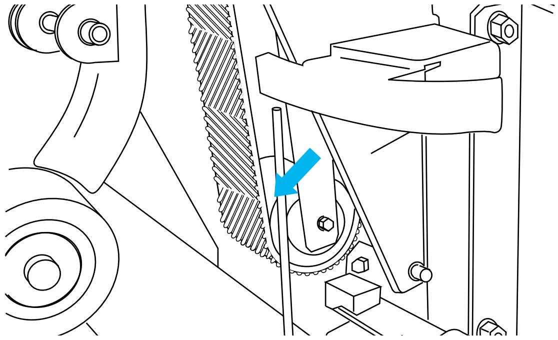
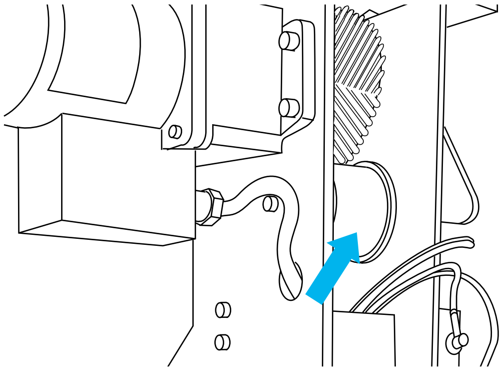
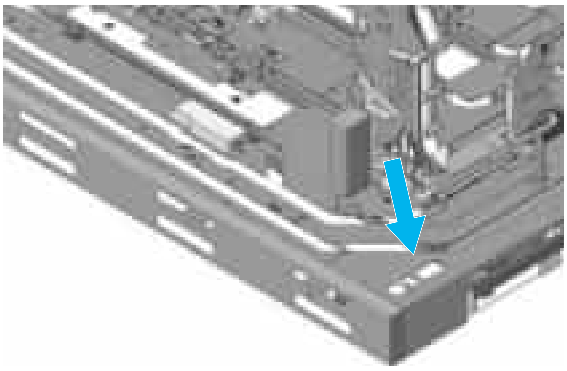
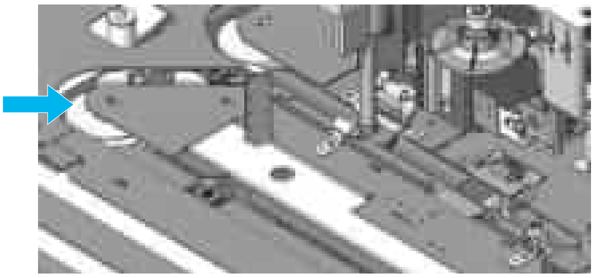
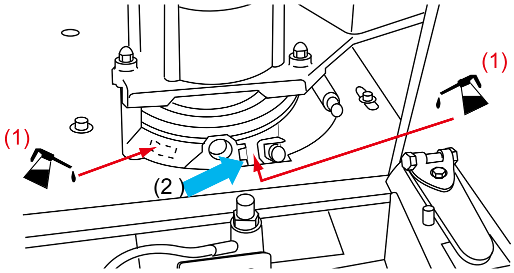
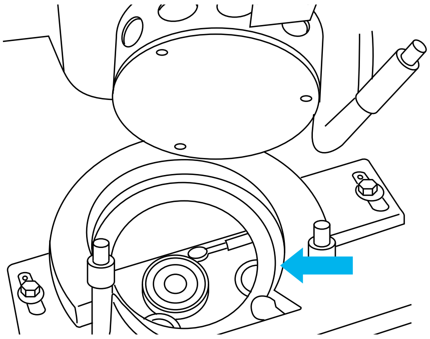
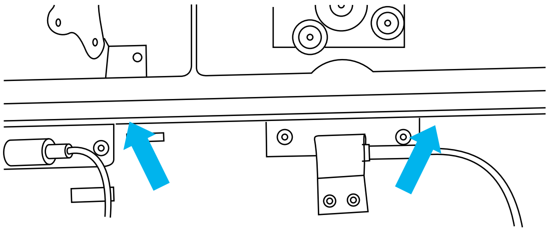
* The above diagram shows a Bobbin Tray with vertical conveyor (left-hand machine for 1 yarn type).



* This figure shows a spring tray specification tray

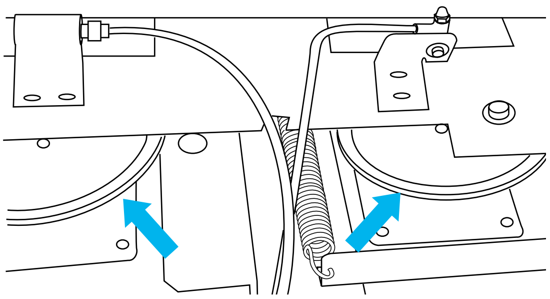


* This figure shows the Hineri (underground) connecting part

G. Conveyor pulley	**H. Bobbin ejector pulley**
Remove yarn waste and cotton fly once a week 	Remove yarn waste once a day 
I. Bobbin ejector pulley	**J. Return conveyor**
Remove yarn waste once a day 	Remove yarn waste once a day 
K. Round belt pulley	**L. Rotary cutter**
Remove yarn waste once a week 	• Lubricate the sliding cutter once a day (SO VG10) * If the cutter has a felt, lubricate it once a week • Check for cutting performance, and remove yarn waste and cotton fly once a day 
M. Rotary cutter	**N. Round belt**
Remove yarn waste and cotton fly once a week 	Remove yarn waste and cotton fly once a day 

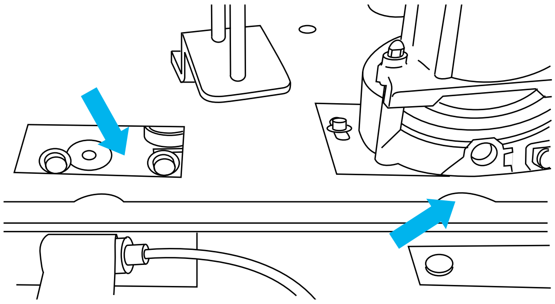
O. Tray rotating pulley

Remove yarn waste once a week



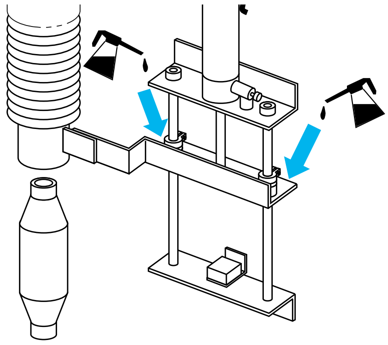
P. Tray stopper bearing

Check for smooth rotation and remove yarn waste once a day



Q. Cop-Robo yarn end finder's sliding shaft

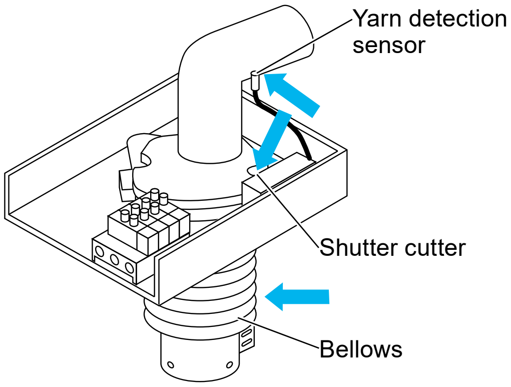
Lubricate once a month



Lubricate the spindle bearings with two or three droplets of spindle oil once a month.
Before applying, use the solenoid valve's manual operation button to lower the cylinder.

R. Cop-Robo yarn end finder

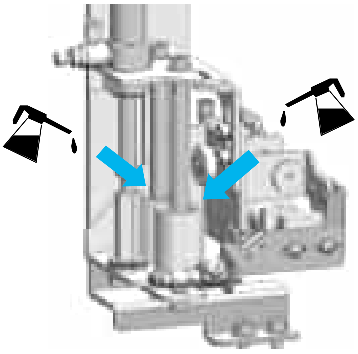
- Check for cutting performance and lubricate (shutter cutter) once a month
- Check for and remove yarn waste and cotton fly (yarn detection sensor) once a week
- Check for and remove yarn waste and cotton fly (inside bellows) every 3 months



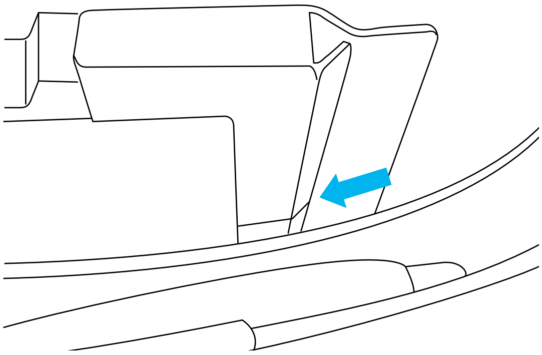
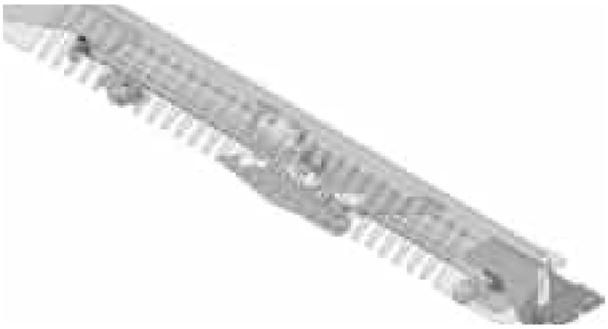
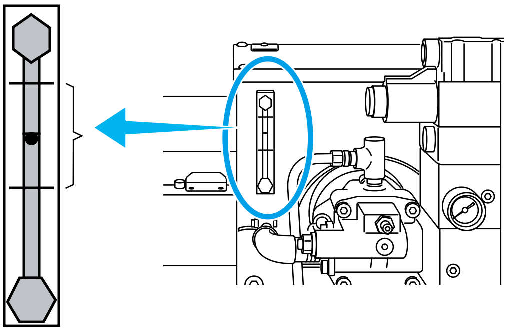
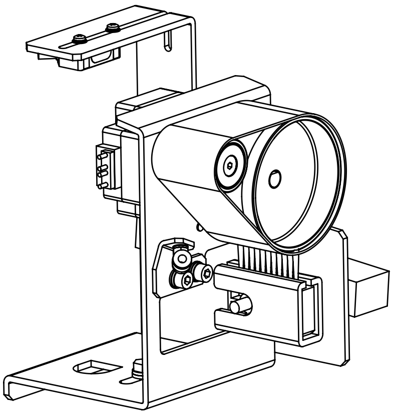
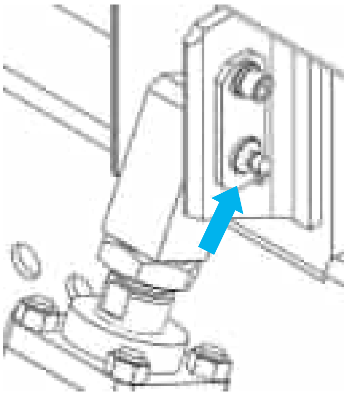
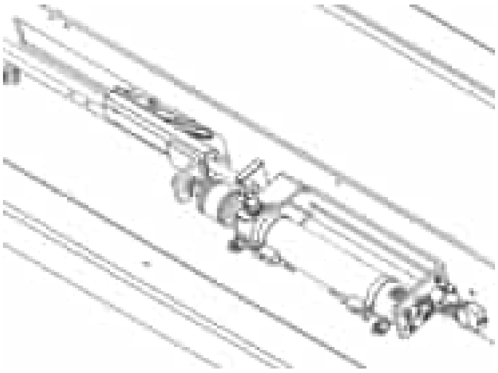
When removing the L-pipe, place it in the open space close to you and be careful to avoid putting any load on the fiber sensor.

Z. Slide shaft on searcher

Lubricate once a month



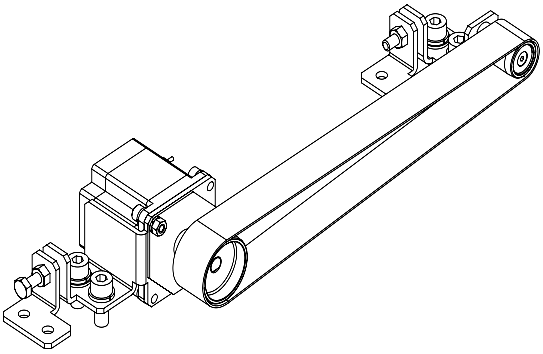
Lubricate the spindle bearings with two or three droplets of spindle oil once a month.
Before applying, use the solenoid valve's manual operation button to lower the cylinder.

S. Parts feeder exit cutter (Bobbin Tray)	**T. Vibrating conveyor exit cutter (Bobbin Tray)**
Check for cutting performance once a day 	- Check for cutting performance and remove yarn waste and cotton fly once a day - Lubricate once a week 
U. Hoist hydraulic pump fluid indicator (Bobbin Tray)	**V. Feed roller (Bobbin Tray)**
Check fluid level once a week  - The hydraulic pump fluid indicator is just inside the hoist door. Verify that the fluid level falls within the indicated range - Oil change once a year - Clean or replace the suction strainer when changing the oi	- Remove yarn waste and cotton fly once a day - Check for smooth rotation once a day - Check the belt for wear and tear once a month 
AA.Hoist shaft (Bobbin Tray)	**AB.Hineri (underground) cylinder (For Link Coner Hineri (underground) connection)**
Lubricate once a year * Extreme-pressure lithium-based grease with mineral oil, NLGI No.2 or No.3  * Carry out work after verifying that the hoist will not operate and ensuring everything is safe.	Remove yarn waste and cotton fly once a month 

W. Flat belt conveyor (Bobbin Tray)

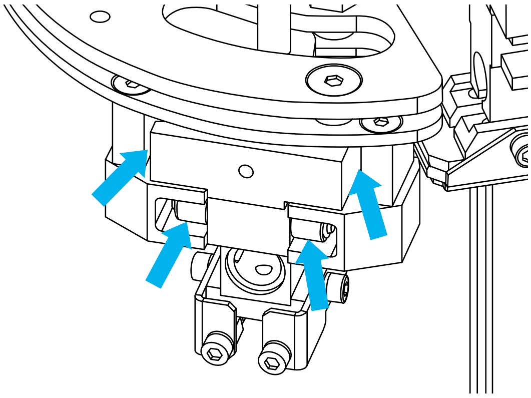
* Lower part of chute, bypass area for Cop-Robo x 2 specification, bobbin ejector horizontal conveyor for 2 yarn type specification.

- Remove yarn waste and cotton fly once a day
- Check for smooth rotation once a day
- Check the belt for wear and tear once a month



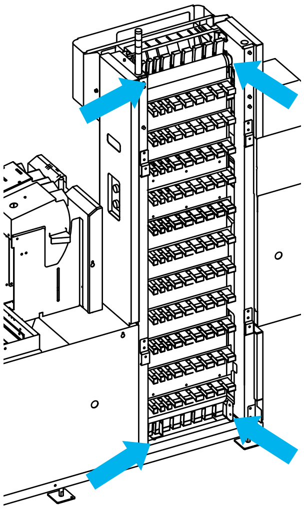
X. Bobbin stripper clamp’s rollers (Link Coner)

Apply grease once a month



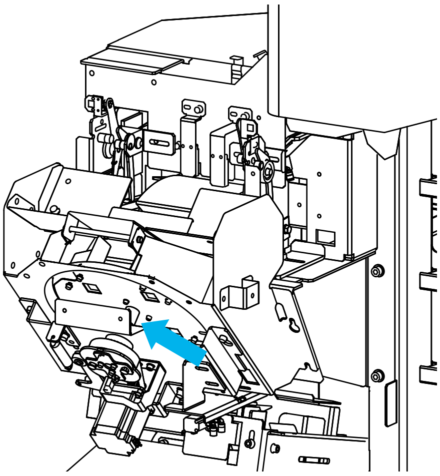
A. Vertical conveyor flat belt pulley

- Remove yarn waste and cotton fly once a day
- Check for smooth rotation once a day
- Check for belt damage once a month



B. Rotor rotation

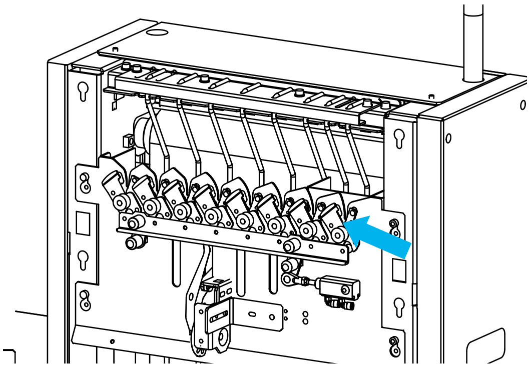
- Remove yarn waste and cotton fly once a day
- Check for smooth rotation once a day



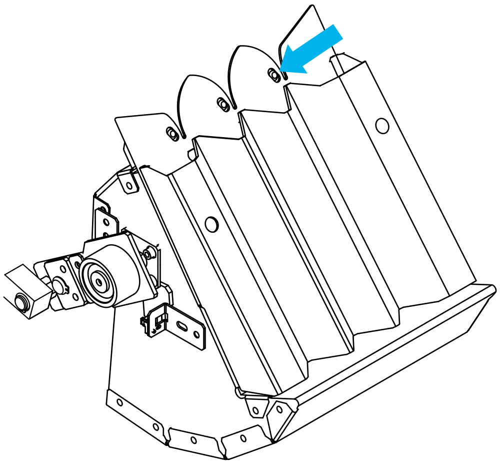
C. Each part of cutter

- Remove yarn waste and cotton fly once a day
- Check for cutting performance and lubricate once a month

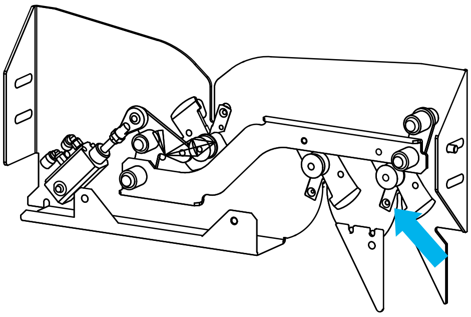
Conveyor’s top cutter



Dam cutter

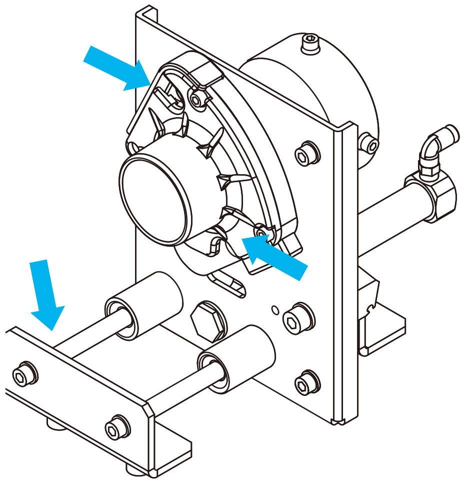


Conveyor’s bottom cutter



D. Bunch remover suction

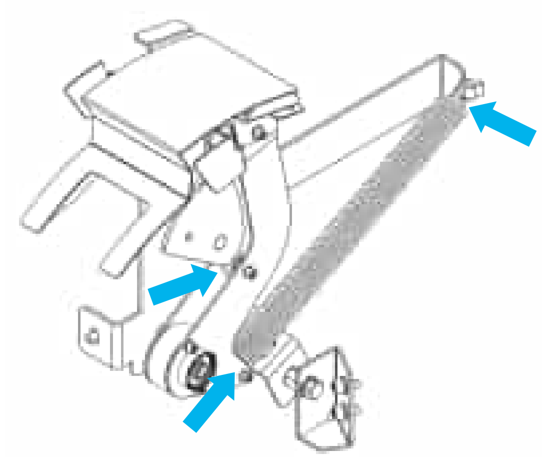
- Check for cutting performance and lubricate shutter cutter once a month
- Remove yarn waste and cotton fly from shutter cutter and slide shaft once a month
- Lubricate slide shaft once a month



E. Pusher (Bobbin Tray)

- Apply grease to cam follower and the spring hook every 6 months.

* Extreme-pressure lithium-based grease with mineral oil and molybdenum disulfide (wet type)

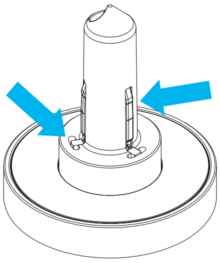


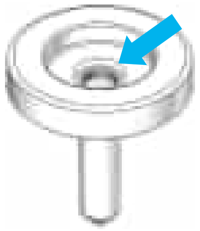
Y. Tray

- **For spring trays**
- Remove yarn waste and cotton fly from the tray base (1 time/week)
- Apply silicon spray to the internal plate spring (1 time/6 months)

- **For trays with mesh**
- Remove yarn waste and cotton fly from mesh section (1 time/6 months)

  * Handle depending on cotton fly buildup conditions.





Sec 2 Maintenance

2-1 Inspection, lubrication, and cleaning

CAUTION

Before carrying out inspections, lubrication, or cleaning, make sure to stop the machine by pressing the machine stop button.
Before carrying out weekly maintenance items, make sure to stop the machine, and remove the cover.

Frequency	Item	Location	Guideline
Daily	CBF	---	Cleaning with compressed air
	Rotary cutter	L	Remove yarn waste and check for cutting performance
	Vibrating conveyor exit cutter	T	Check for cutting performance and remove cotton fly
	Parts feeder exit cutter	S	Check for cutting performance
	Tray stopper bearings	P	Remove yarn waste and check for bearings' smooth rotation.
	Round belt, Flat belt	N, V, W	Remove yarn waste and cotton fly
	Bobbin ejector pulleys	H, I	Remove yarn waste
	Vertical conveyor flat belt pulley	A	Remove yarn waste and cotton fly, and check for smooth rotation
	Rotor rotation	B	Remove yarn waste and cotton fly, and check for smooth rotation
	Each part of cutter	C	Remove yarn waste and cotton fly
Weekly	Round belt pulleys	K	Remove yarn waste
	Tray rotating pulleys	O	Remove yarn waste
	Rotary cutter	M	Remove cotton fly
	Return conveyor	J	Remove cotton fly
	Cop-Robo yarn end finder yarn detection sensor	R	Remove yarn waste and cotton fly
	Hoist hydraulic pump fluid indicator	U	Check fluid level
	Spring tray	Y	Remove yarn waste and cotton fly
	Vibrating conveyor exit cutter	T	Lubricate
Monthly	Cop-Robo yarn end finder's shutter cutter	R	Check for cutting performance
	Cop-Robo yarn end finder's sliding shaft	Q	Lubricate the sliding bearing
	Searcher	Z	Lubricate the sliding bearing
	Round belt, Flat belt	N, V, W	Check the belt for wear and tear
	Bobbin stripper clamp's rollers	X	Apply grease
	Vertical conveyor flat belt pulley	A	Check for belt damage
	Each part of cutter	C	Check for cutting performance and lubricate
	Shutter cutter on bunch remover	D	Check for cutting performance, lubricate, and remove yarn waste and cotton fly
	Slide shaft on bunch remover	D	Lubricate slide bearing, and remove yarn waste and cotton fly
	Hineri (underground) cylinder	AB	Remove yarn waste and cotton fly
Every 6 months	Pusher	E	Apply grease
	Spring tray	Y	Apply silicone spray
	Trays with mesh	Y	Remove yarn waste and cotton fly
Yearly	Hoist shaft	AA	Lubricate

* Refer to Chapter 8B, section 1 for "Location".

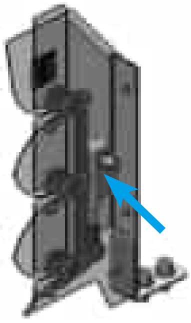
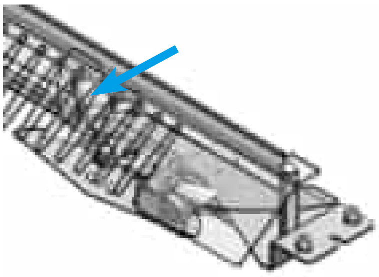
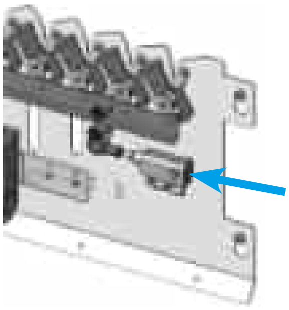
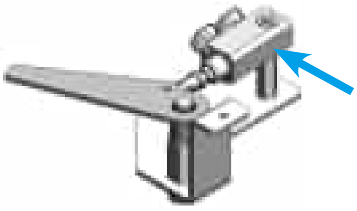
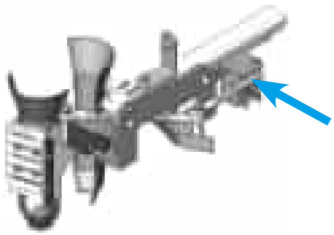
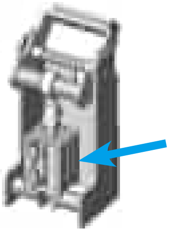
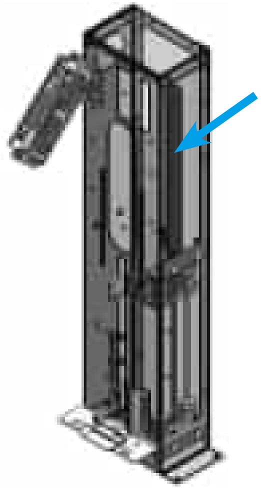
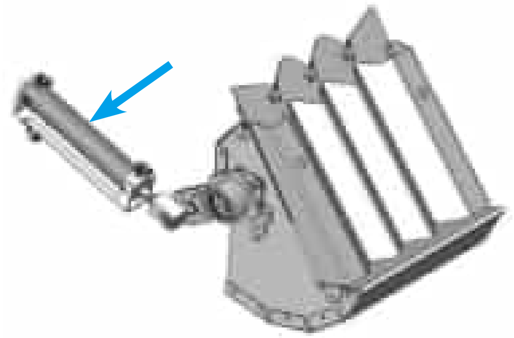
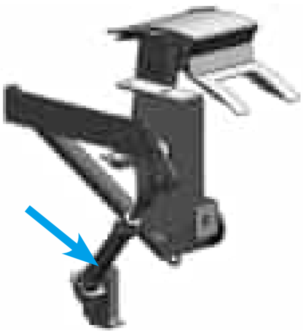
* If there are any worn parts found during the checks described above, replace with new ones.

2-2 Packing of the air cylinder replacement

Check the operation of the cylinder at regular intervals, and replace the packing if any of the following occur:

- The cylinder does not operate smoothly
- There is a change in piston speed or cycle time
- There is an irregularity in the stroke

Locations of cylinders with replaceable packing

Cylinder	Location used
A	CBF conveyor cutter  Vibrating conveyor exit cutter (Bobbin Tray only)  Cutter for VCF (conveyor cutter, shutter cutter)  Tray stoppers and separator  Chute (Bobbin Tray only)  Bobbin holder (VCF only) 
B	Cop-Robo suction mouth  Dam (VCF only) 
C	Bobbin pusher on top/bottom feeler (Bobbin Tray only) 

Grease

Grease specifications	Grease product name
Please be sure to use the grease that comes with the packing set	
Mineral oil-base lithium extreme pressure grease NLGL No.1,No.2	Cosmo Oil Co., Ltd.: Cosmo Grease Dynamax Idemitsu Kosan Co.,Ltd.: Daphne Eponex Grease Shell: Alvania EP grease

* Product names are the trademarks or registered trademarks of each manufacturer company.

* When using any grease other than the grease pack, please remove the existing grease before applying the new grease.
* Please avoid mixing different grades of grease, even if they are from the same brand.
* For details of what is required when applying the grease, please refer to the instructions of the brand and grade of grease.

CAUTION

Using any type of grease other than those specified, or using a liquid lubricant agent, will degrade the rubber that forms the material of the packing, even if the lubricant temporarily offers lubrication properties. In addition, using such lubricants may also shorten the operating life of the cylinder itself.

Cylinder disassembly & reassembly

Please disassemble and reassemble the cylinder in a clean location. In addition, please remove any external dirt. Please be especially careful of the piston rod surface and collar.

* Refer to Chapter 8B, 2-2 for packing removal, grease application, and packing attachment.

- **A**

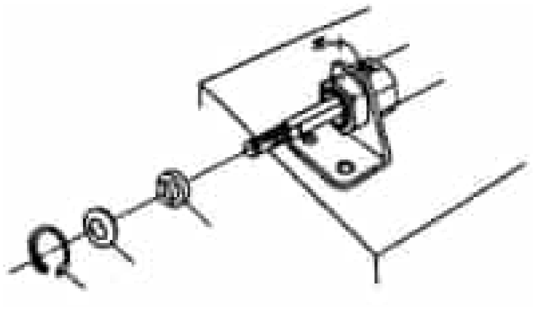
1. **Press the clevice bush out from inside the cylinder.**
   * Please be careful not to damage the bush.
2. **Extract the piston rod from the body.**
   * To reassemble the cylinder, perform the removal procedure.

- **B**

1. **Hold the double bevel on the cylinder body rear in place with a vice or similar tool.**
2. **Loosen and remove the double bevel on the rod side with a spanner, monkey wrench or other tool.**
   * When reassembling the cylinder, please tighten 2° more than it was before.

- **C**

The cylinder body and the cover on the back end of the cylinder are bonded together by crimping, and therefore it cannot be disassembled. Only the rod packing can be replaced.



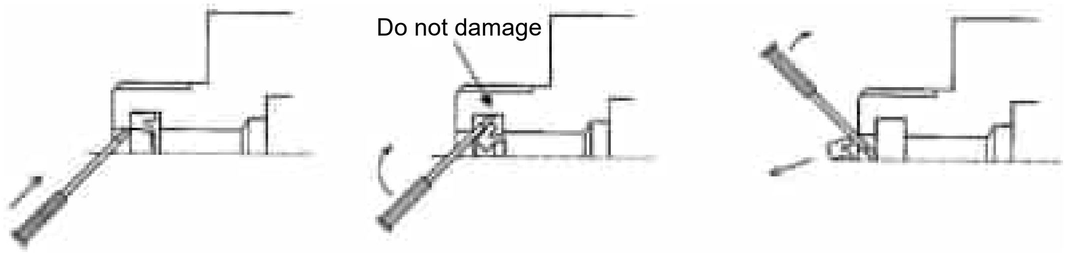
1. **Use a suitable pair of pliers to remove the ring, cover the rod air port with a finger, and pull out the piston rod**
   The packing cover and rod packing are removed.
2. **Be sure to apply sufficient grease to the rod packing interior and outer edge. Also fill the groove with grease as well.**
3. **Fit the rod packing, being careful it is facing the correct direction. Slowly insert the rod packing while gently rotating it. Fit the packing cover and ring.**

Packing removal

Please disassemble and reassemble the cylinder in a clean location. In addition, please remove any external dirt. Please be especially careful of the piston rod surface and collar.

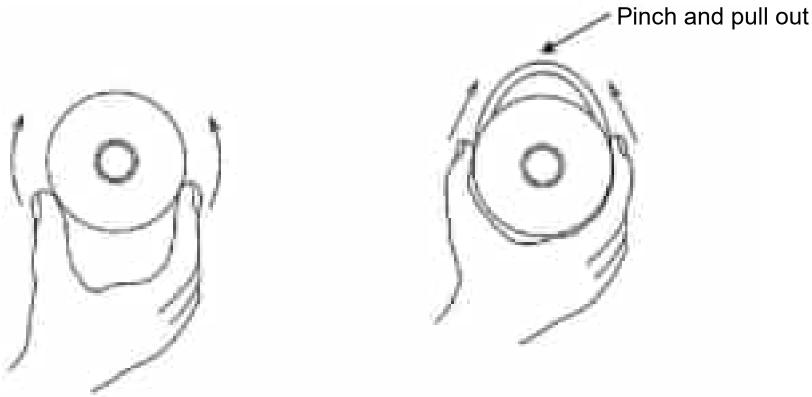
1. **Insert a precision screwdriver or other tool to remove the packing from the front surface of the body.**

   * Please be careful not to damage the body packing groove.



2. **Squeeze the edges of the piston packing in the same direction, and then pull out the raised area.**

   * The piston packing groove is deep, so use your hand rather than a precision screwdriver.



3. **Squeeze with your hand and then pull out the raised area.**

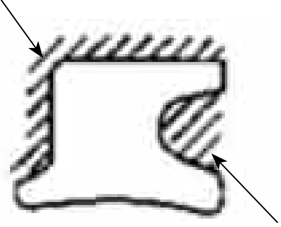
Grease application

- **Rod Packing**

Thinly and evenly apply to the outer edge of the replacement packing. Also fill the groove with grease as well.

- **Piston packing**

Apply thinly and evenly to the interior and outer edge.



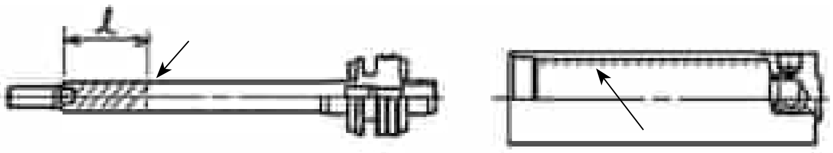
- **Tube gasket**

Apply thinly.

- **Cylinder parts**

Apply grease to all of the sliding parts of the cylinder.

$$\ell = \text{stroke} \times \frac{1}{2}$$

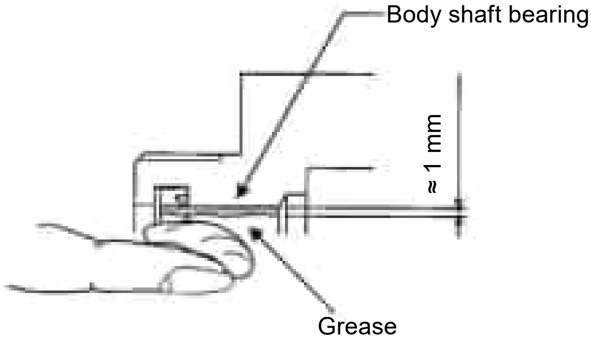


Packing attachment

1. **Be careful to orient the direction of the packing correctly when fitting it.**

2. **Apply grease to all the inner edges of the packing and the body shaft bearing, as shown in the diagram.**

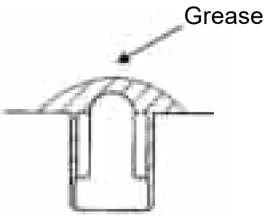
   * If the cylinder has a small bore, use a precision screwdriver or another tool to apply the grease.



3. **Fit the piston packing so that it does not get twisted.**

4. **Apply the grease to the piston packing groove and the outer edge as shown in the diagram.**

5. **Be careful not to drop the tube gasket while fitting it.**



Assembly check

1. **When inserting the piston or collar into the body, insert them slowly and gently to avoid damaging the packing.**
2. **When you have finished assembling the cylinder, manually move the parts to ensure their smooth operation. In addition, ensure that the packing is not damaged by checking for leaks.**

Packing storage method (long-term storage)

Seal the packing for storage, and store it as-is.

* Store the packing in a cool, dry place away from direct sunlight. In particular, please keep the packing separated and secluded from machinery which can readily emit heat, radiation or ozone.

* Please be careful not to deform or damage the packing by stacking large quantities of packing, or placing heavy objects on top of it.

* While rubber products are being stored, white powder may appear on the surface. This does not affect the performance of the packing.

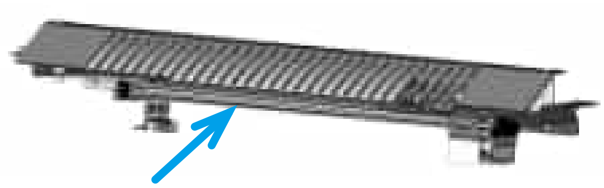
* Source
This chapter is taken from the following SMC user manuals:
A: No.CJP-OM0001K-A
B: No.CG1*-OM0005N
C: No.CM2*-OM0007C-A

2-3 Packing of the rodless air cylinder replacement

The packing used inside the rodless air cylinder at the locations indicated below can be replaced.
Check the operation of the cylinder at regular intervals, and replace the packing if any of the following occur:

- The cylinder does not operate smoothly
- There is a change in piston speed or cycle time
- There is an irregularity in the stroke

Locations of cylinders with replaceable packing

Cylinder	Location used
D	Vibrating feeder exit cutter (Bobbin Tray only) 

Grease

Grease specifications	Grease product name
Mineral oil-base lithium extreme pressure grease NLGL No.1,No.2	Cosmo Oil Co., Ltd.: Cosmo Grease Dynamax Idemitsu Kosan Co.,Ltd.: Daphne Eponex Grease Shell: Alvania EP grease

* Product names are the trademarks or registered trademarks of each manufacturer company.

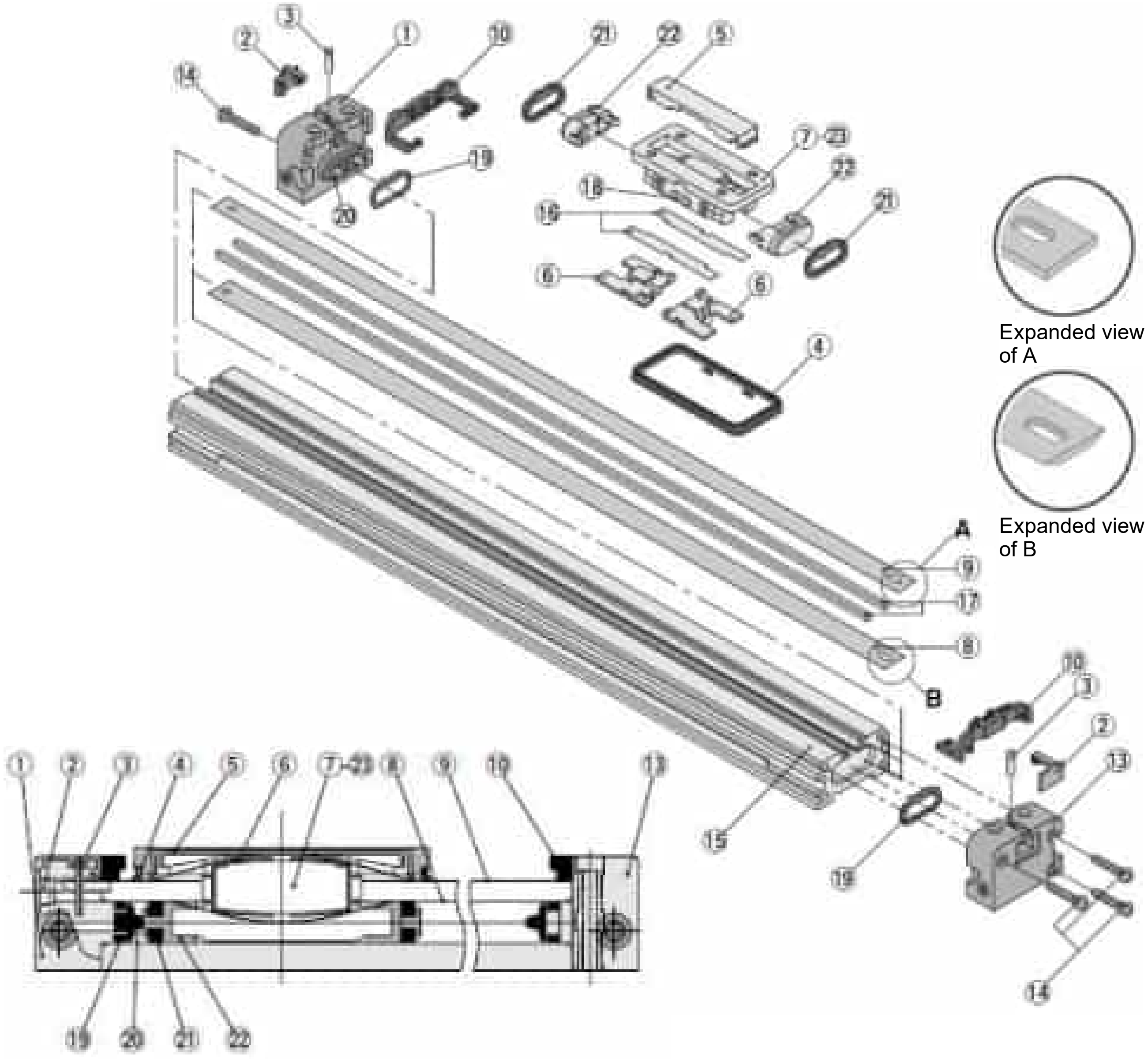
* Please avoid mixing different grades of grease, even if they are from the same brand.
* For details of what is required when applying the grease, please refer to the instructions of the brand and grade of grease.

CAUTION

Using any type of grease other than those specified, or using a liquid lubricant agent, will degrade the rubber that forms the material of the packing, even if the lubricant temporarily offers lubrication properties. In addition, using such lubricants may also shorten the operating life of the cylinder itself.

Structual drawing

- **Cylinder (21G-747-001)**


③
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⑱
㉒
⑯
㉑
⑥
⑥
④
Expanded view of A
Expanded view of B
A
⑨
⑰
⑧
B
⑩
③
②
⑬
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⑲
⑭
① ② ③ ④ ⑤ ⑥ ⑦-㉓ ⑧ ⑨ ⑩ ⑬
⑲ ⑳ ㉑ ㉒

[Names of each parts]

No.	Name	No.	Name
(1)	End cap R	(14)	Button bolt with hex-head hole
(2)	Cap cover	(15)	Cylinder barrel
(3)	Tape stop pin	(16)	Shim
(4)	Scraper	(17)	Magnet strip
(5)	Mount cover	(18)	Magnet
(6)	Tape guide	(19)	Cylinder gasket
(7)	Piston yoke	(20)	Piston bumper
(8)	Inner sealing tape	(21)	Piston Packing
(9)	Outer sealing tape	(22)	Piston
(10)	Mount bumper	(23)	Inner tape guide
(13)	End cap L		

* (18), (20), and (23) are bonded on and cannot be disassembled.

* Replacement packing includes the following packings.

Scraper (4)	1 pc
Mount cover (5)	1 pc
Tape guide (6)	2 pcs
Cylinder gasket (19)	2 pcs
Piston Packing (21)	1 pc

Replacement procedure

For replacement of parts using the packing set (21G-747-100), follow the disassembly and assembly steps shown below.

Please disassemble and reassemble the cylinder in a clean location. In addition, please remove any external dirt.

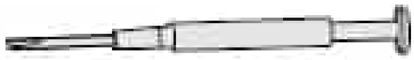
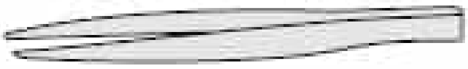
WARNING

- **Always completely shut off the supply of air, and confirm that pressure inside the product, and piping connecting the product, is at zero before operations.**
- **After assembly, always confirm that parts are assembled and screws tightened before supplying air to the product.**
- **As the parts include items with sharp angles and edges, be careful to avoid physical injuries. In addition, use protective gloves and protective glasses where necessary to ensure safety. Be particularly careful with the inner sealing tape, which has sharp edges along the side.**

CAUTION

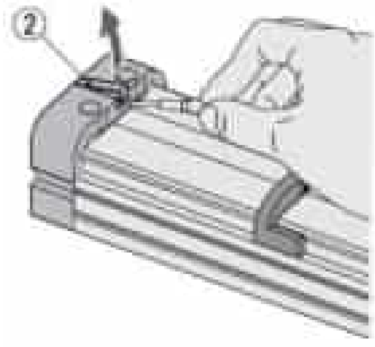
Avoid leaving scratches or dents in the inner sealing tape and outer sealing tape.
They could result in air leaks.

- **Tools used**

Hexagonal bar wrench	
Small screwdriver	
Radio pincers or tweezers	
Plastic sheet	**CAUTION** Contacting the side surface edge of the inner sealing tape with hard materials (metals, concrete, etc.) can deform it, resulting in air leakages. During disassembly and assembly, cover the inner sealing tape with plastic sheet in places where it looks most likely to be contacted.

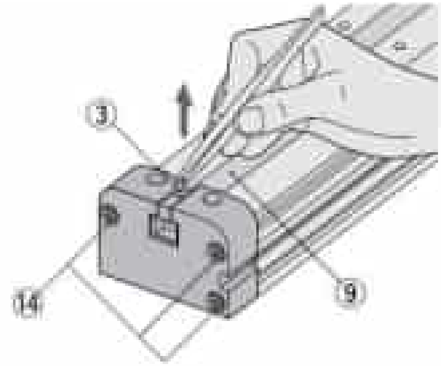
- **Disassembly steps**

1. **Insert the small screwdriver into the grip on the cylinder barrel side, rotate the cap cover (2), and remove.**

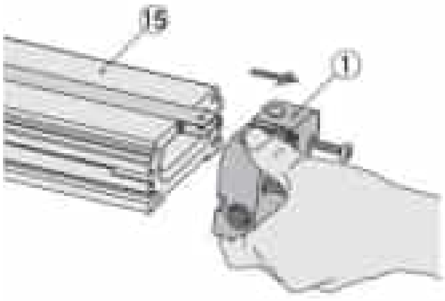


2. **Use the radio pincer or tweezer to grab and pull out the pin (3) fixing the inner sealing tape (8) and outer sealing tape (9) in place.**

3. **Remove the three bolts (14) used to tighten the end cap.**

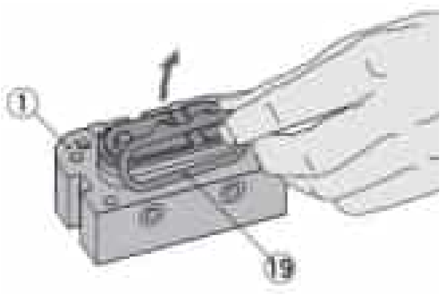


4. **Remove the end cap (1 [13]) from the cylinder barrel (15).**

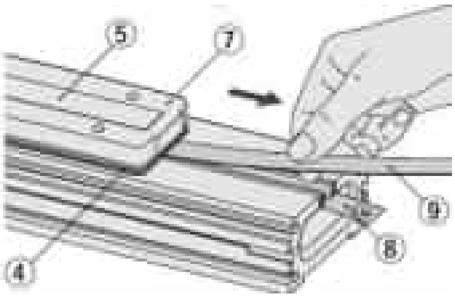


5. **Remove the cylinder gasket (19) from the end cap.**

6. **Use the same steps to remove the cylinder gasket on the other end cap.**



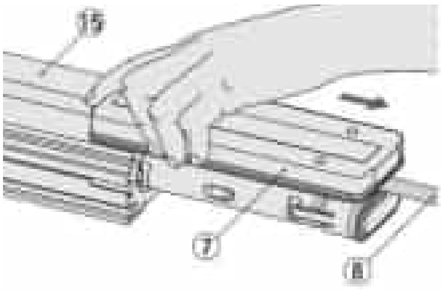
7. **Remove the outer sealing tape (9) from between the piston yoke (7), mount cover (5), and scraper (4).**



WARNING

As the inner sealing tape has sharp edges along the side, take care to avoid physical injuries.

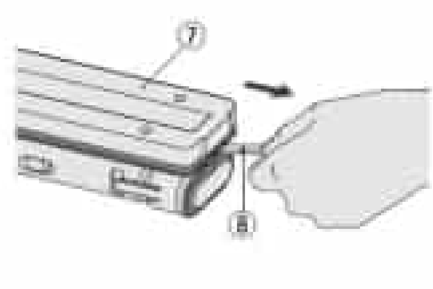
8. **Slide the piston yoke (7), and remove it from the cylinder barrel (15). At the same time, remove the inner sealing tape (8) from the cylinder barrel.**



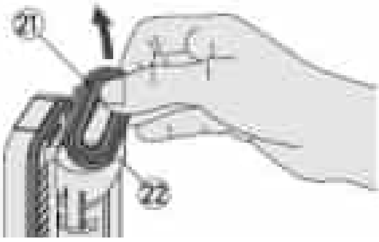
9. **Remove the inner sealing tape from between the piston yoke and tape guide.**

WARNING

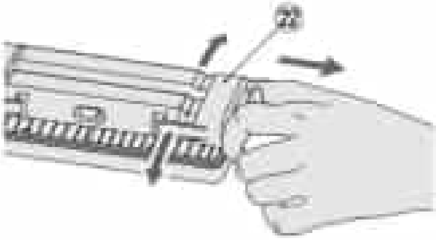
As the inner sealing tape has sharp edges along the side, take care to avoid physical injuries.



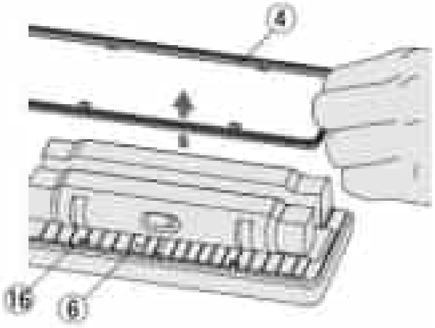
10. **Remove the piston seal (21) from the piston (22).**



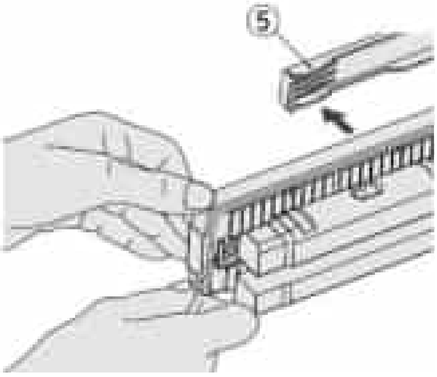
11. **Spread the grips on the piston, and remove it.**



12. **Remove the tape guide (6), shim (16), and scraper (4).**
* The tape guide cannot be removed until the piston is pulled out.



13. **Use a screwdriver, etc., to push up on grips of the mount cover (5), and remove it.**



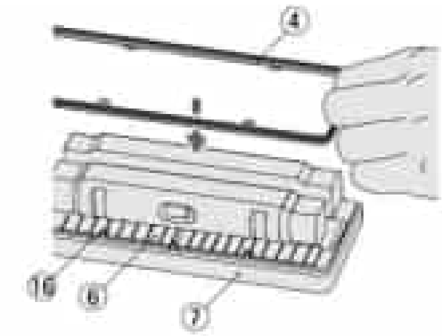
- **Remark**

When removing the mount cover only, for replacement of the outer sealing tape, etc., it can be removed by inserting a small screwdriver, etc. into the center of the scraper to control the grip.

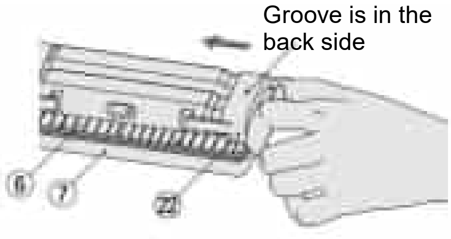
- **Assembly steps**

CAUTION Avoid leaving scratches or dents in the inner sealing tape and outer sealing tape. They could result in air leaks.

1. **Assemble the tape guide (6), shim (16), and scraper (4) to the piston yoke (7).**



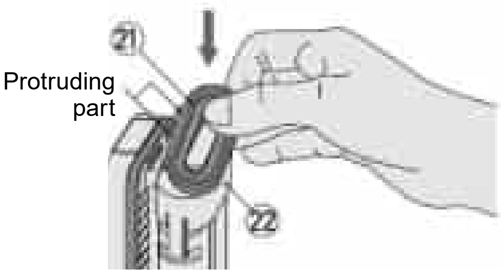
2. **Assemble the piston (22) to the piston yoke, with the groove taking the inner sealing tape (8) facing in the direction of the tape guide side.**



3. **Position the protruding side of the piston sealing (21) so that it faces upward (inner sealing tape side) and the open side of the lip so that it faces outward, and assemble it to the piston.**

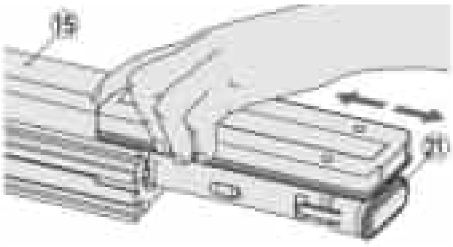
   * Apply a plenty of grease to the area.

CAUTION The protruding part has been exaggerated in the illustration for easy understanding. Watch carefully, however, since it actually protrudes by just a very small amount.



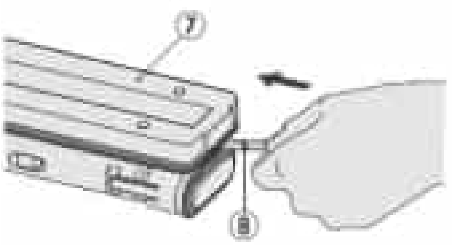
4. **With the piston sealing mounted and grease applied, insert into the cylinder (15) barrel.**
   Apply grease to inside of the cylinder barrel while moving it two or three times across its full stroke.

   * Apply plenty of grease to the rubbed portions of the piston yoke and the piston yoke's sealing tape.



5. **Pass the inner sealing tape (8) between the piston yoke (7) and tape guide (6), and assemble.**

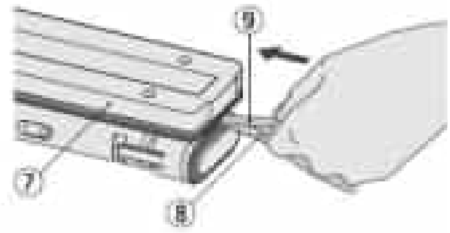
* At this time, mount so that the surface chamfering side of the faces toward the inner side of the cylinder barrel (15).



WARNING

As the inner sealing tape has sharp edges along the side, take care to avoid physical injuries.

6. **Ensure that the hole shapes of the outer sealing tape (9) are oriented in the same way as the round hole and long hole of the inner sealing tape (8), pass it between the piston yoke and tape guide, and assemble.**



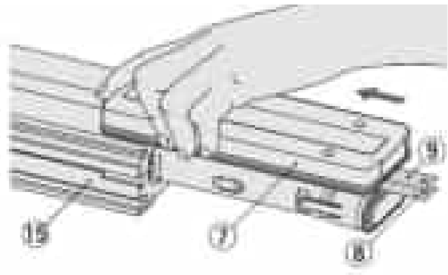
WARNING

As the inner sealing tape has sharp edges along the side, take care to avoid physical injuries.

7. **Apply grease to the bottom surface of the tape guide and to the bottom surface groove of the scraper.**

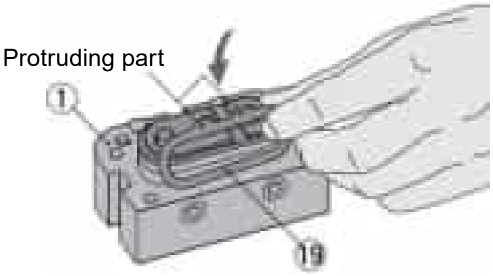
8. **Insert the piston yoke (7) into the inner side of the cylinder barrel (15) so that the inner sealing tape (8) is on the inside of the (15) and the (9) is on the outside of the (15).**

* When inserting the (7), press lightly on the tape guide from underneath to ensure that it does not get hung up on corners in the (15).



9. **Assemble the cylinder gasket (19) to the end cap (1 [13]).**

* At this time, leave the protruding side of the (19) facing upward, and bring the protrusion toward the center. Moreover, always apply grease to the (19).



CAUTION

The protruding part has been exaggerated in the illustration for easy understanding. Watch carefully, however, since it actually protrudes by just a very small amount.

10. **Align the holes of the inner sealing tape (8) and outer sealing tape (9), and ensure that their outward dimensions are evenly set left and right in regards to the cylinder barrel (15).**

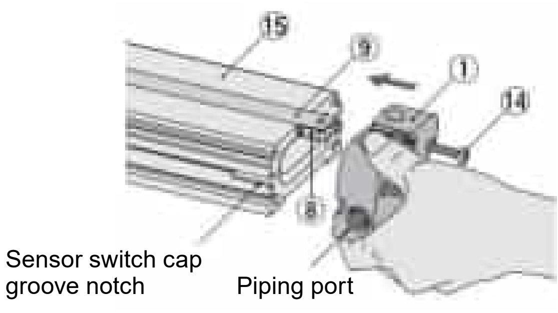
11. **Insert the end cap (1 [13]) into the cylinder barrel, tighten the end cap, and loosely tighten the three button bolts (14) with hex-head holes (on both sides).**

    * Avoid using an impact wrench to strongly tighten the screws from the start. Since the (14) are tapping screws, tightening the end cap and the bolts too soon could damage the threads.

12. **Place the unit on a table as assembled to Step 11, then, while pushing down from above on the end cap, tighten the end cap to the cylinder barrel, and tighten the three bolts (14) (both sides).**

    * Confirm that the piping connection port and the notch on the sensor switch cap groove are facing in the same direction.

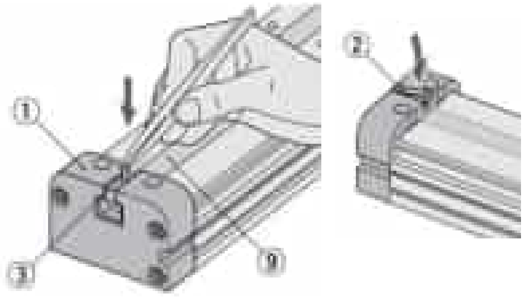
    * The tightening torque for bolts should be 1.1 N•m.



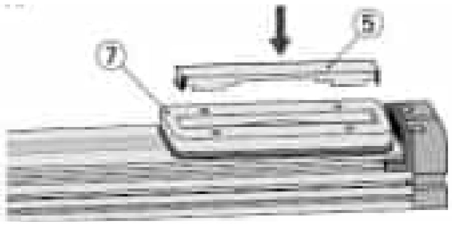
13. **Insert the pin (3) into the round-shaped holes of the inner sealing tape and outer sealing tape.**

14. **Use a small hexagonal bar wrench or pincer, etc., to pull on the inner sealing tape from the gap on the opposite side of the end cap's end surface, to take out the slack in the inner sealing tape. Do not pull on it with too much force at this time. Insert the pin into the long hole side. Assemble the cap cover (2).**

    * Do not pull with excessive force when taking out the slack.



15. **Push down on the mount cover (5) from above the piston yoke (7), and assemble.**



16. **When you have finished assembly, move the parts manually to ensure that they move smoothly. In addition, check for leaks to ensure that the packing is not damaged.**

Packing storage method (long-term storage)

Refer to Chapter 8B, 2-2.

* Source
This chapter is taken from the KOGANEI user manuals.

2-4 Spring tray lubrication method

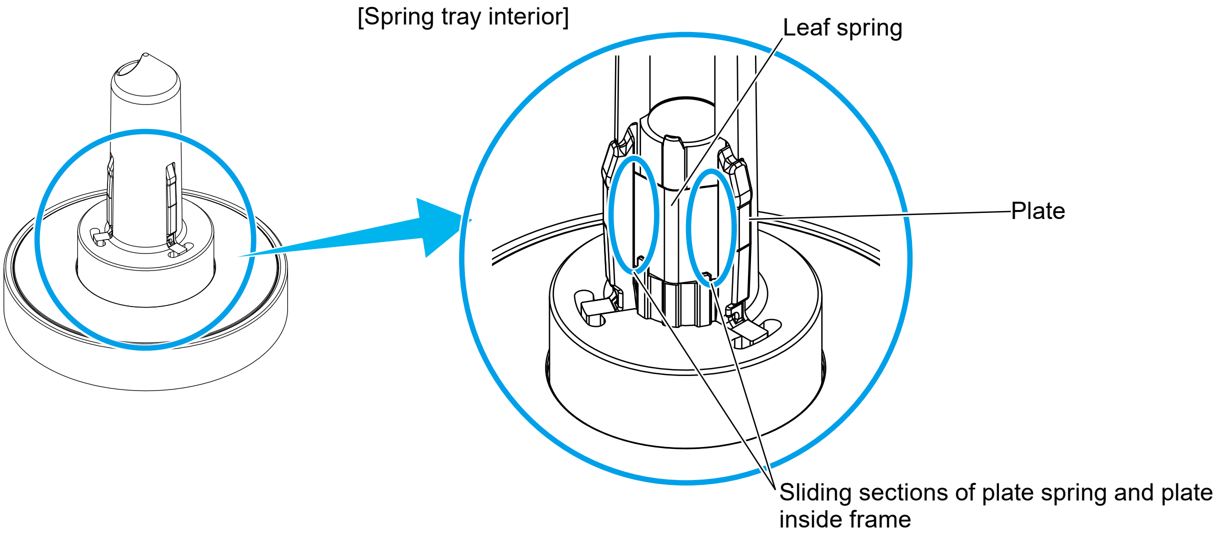
It is necessary to apply lubricant to the internal component metal part sliding sections for spring trays.
Use the following method to apply silicon spray once per 6 months.

Recommend spray

Manufacturer	Product name	Product number
KURE Engineering Ltd.	Silicone Lube Spray	E-1420-98A

* Product names are the trademarks or registered trademarks of each manufacturer company.

Parts requiring lubrication

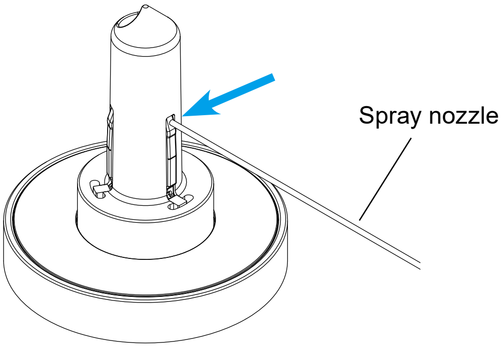


Lubrication method

1. **Push on the plate and apply spray to the opening formed at the top.**

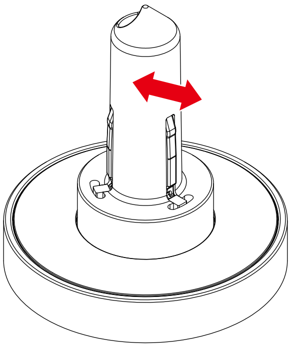
   Apply spray for 0.5-1 second each time.

   * If sprayed for too long, excess lubricant will overflow on the outer surface of the tray. Do not spray for too long.



2. **Push on the plate several times to evenly coat silicon spray.**

   * Apply several times if sliding is still not smooth.
3. **Apply spray in the same manner to the plates in all 3 locations.**
4. **Wipe off any excess lubricant which seeps out onto the exterior of the tray. Not doing so may result in lubricant adhering to the bobbin inner surface.**



Sec 3 Oil Reference Table

Oiling spot	Viscosity/Grade	Grease product name
Hoist hydraulic pump	ISO VG32 or a comparable	Shell: Tellus Idemitsu Kosan Co.,Ltd.: Hydro, Super Hydro JXTG Nippon Oil & Energy Corporation：Super Highland Cosmo Oil Co., Ltd.: Cosmo Hydro EXXON Mobil Corporation: DTE、SHC

* Product names are the trademarks or registered trademarks of each manufacturer company.

Sec 4 Periodic Maintenance of Parts

A constant voltage power supply is comprised of many parts. Some of these component parts require maintenance depending upon the conditions of use. For a constant voltage power supply to function properly for a long period of time, it is necessary to replace those parts after their service life.

When to replace the parts differs depending upon the installation environment and operating conditions of constant voltage power supplies. The maintenance periods of constant voltage power supplies are listed below to be used as a reference for periodic maintenance.

Element name	Device No.	Normal life cycle*	Countermeasure
Constant voltage power supply inside the CBF control box	PU201	4 years	Replace with new part
Constant voltage power supply inside the PF control box	PU301	7 years	Replace with new part

* Normal operating conditions are as follows:

Annual average ambient temperature	40°C
Maximum load factor	50 %
Maximum daily operation	12 hours

Sec 5 Replacement of electrical parts

5-1 Fuse replacement

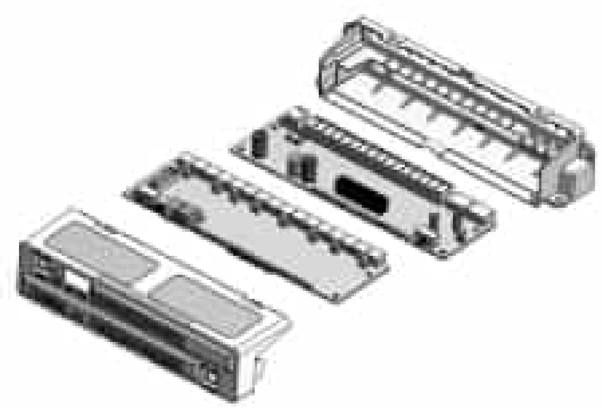
Turn the main switch OFF, and correct the cause of the fuse blowing, then replace the fuse.

CAUTION

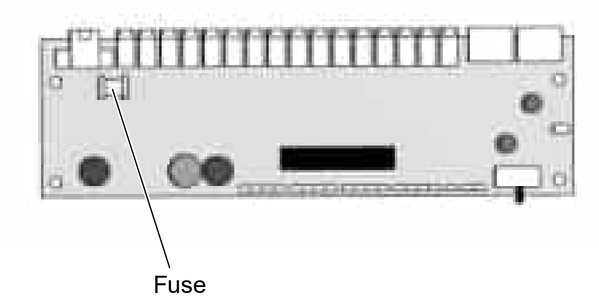
Always use genuine Muratec fuses as a replacements when a fuse used in the machine blows. If any fuses other than genuine fuses are used, it could result in unforeseen problems, such as the non-genuine fuses failing to protect the circuits in the event of an abnormality, or the non-genuine fuses exploding.
Refer to the electrical drawings for the genuine fuse specifications.

Remote I/O slave

1. **Turn the main switch OFF.**
2. **Disconnect the cables connected to the slave.**
3. **Remove the board from the case.**



4. **Replace the fuse.**
   * Use needle-nose pliers or another appropriate tool to grab the center of the fuse and remove it from the holder.
5. **Replace the board in the case.**
6. **Reconnect the cables to the slave.**



Sec 1 External View & Names of Each Part

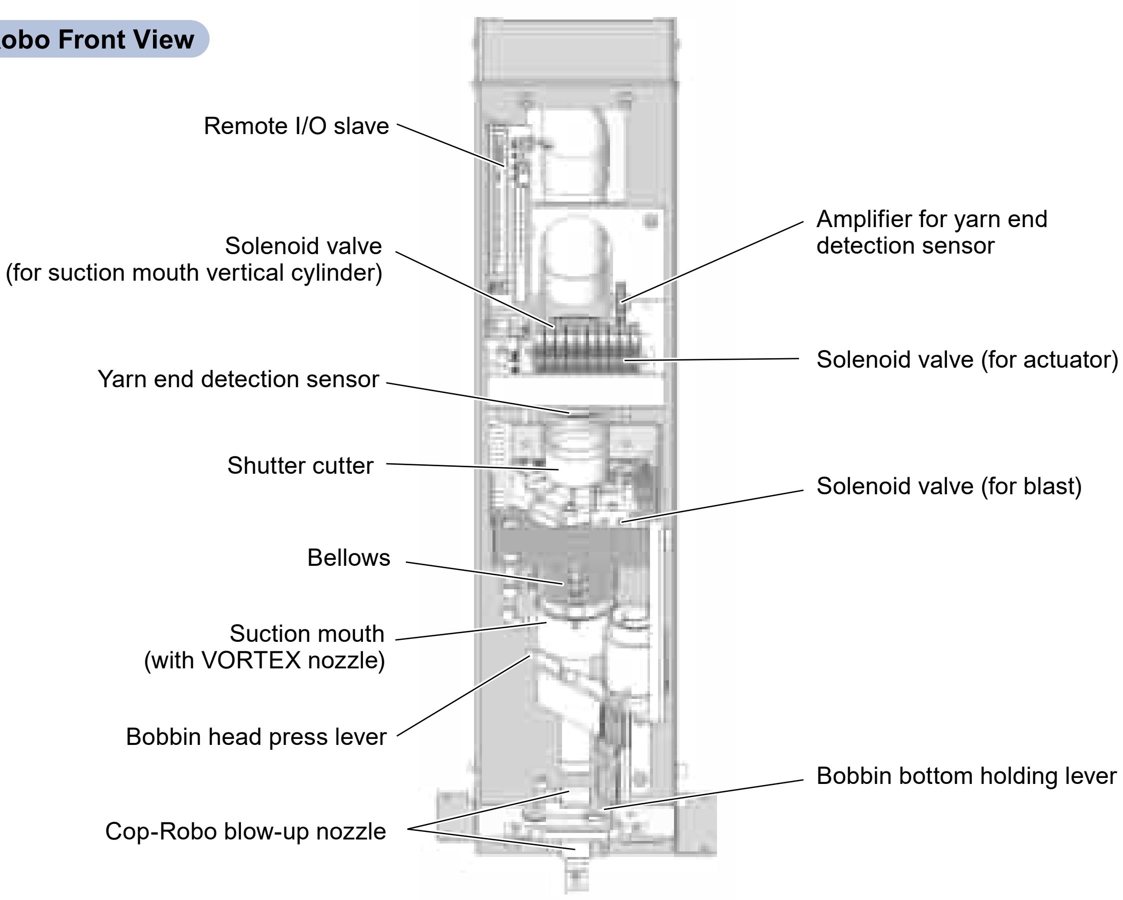
This device is called a yarn end finder. It finds the end of the yarn on a spinning bobbin and inserts it into the top hole of the bobbin.

If the yarn end on the spinning bobbin is not found on the first attempt, the operation is repeated (the number of attempts can be set between 3 and 5).

In addition, the yarn end find operation is also possible on half cops (partial bobbins).

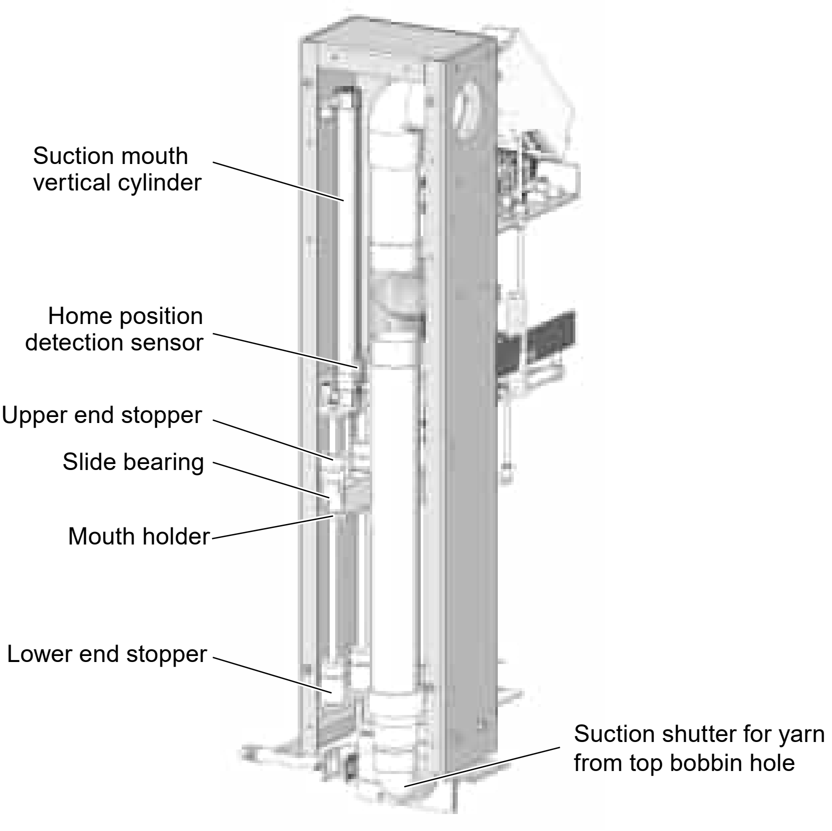
1-1 Cop-Robo

Cop-Robo Front View


Remote I/O slave
Solenoid valve
(for suction mouth vertical cylinder)
Yarn end detection sensor
Shutter cutter
Bellows
Suction mouth
(with VORTEX nozzle)
Bobbin head press lever
Cop-Robo blow-up nozzle
Amplifier for yarn end detection sensor
Solenoid valve (for actuator)
Solenoid valve (for blast)
Bobbin bottom holding lever

* Refer to Chapter 8C, 1-2 for a detailed layout of the solenoid valves for the actuator and the blast operation.

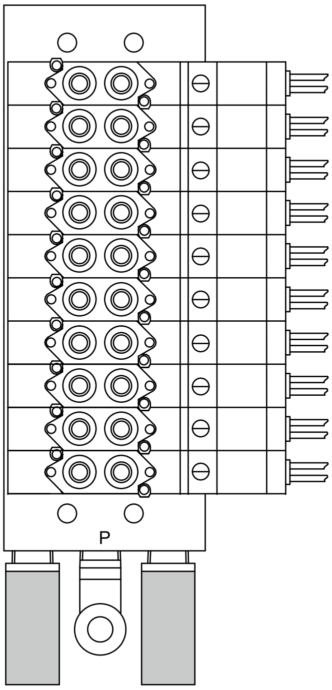
Cop-Robo Rear View


Suction mouth vertical cylinder
Home position detection sensor
Upper end stopper
Slide bearing
Mouth holder
Lower end stopper
Suction shutter for yarn from top bobbin hole

1-2 Air Valve

Layout of Solenoid Valves for Actuator

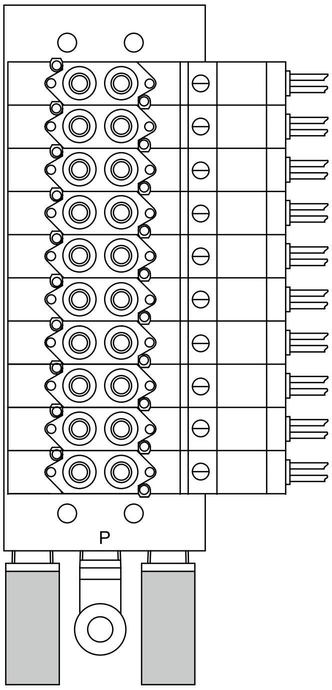
- **Link Coner**



Cop-Robo x 1	Cop-Robo x 2	
	Machine front	**Machine rear**
Lever for rotary cutter tray rotation *b		
Lever for searcher tray rotation		
Searcher stopper		
Searcher		
Shutter cutter		
Bobbin bottom holding lever		
Suction shutter for yarn from top bobbin hole		
Yarn end finder miss bobbin separator		
CBF exit lever	Lead tray stopper on return conveyor bypass	CBF exit lever
Beater *a		

*a, *b is present on some specifications.

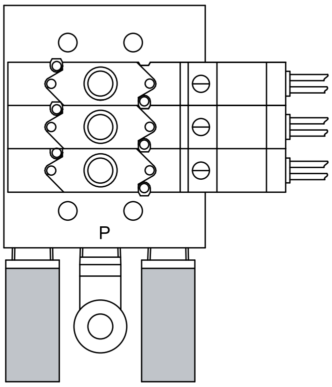
- **Bobbin Tray**



Cop-Robo x 1	1 yarn type: Cop-Robo x 2		2 yarn type: Cop-Robo x 2	
	Machine front	**Machine rear**	**Machine front**	**Machine rear**
Lever for rotary cutter tray rotation *b				
Lever for searcher tray rotation				
Searcher stopper				
Searcher				
Shutter cutter				
Bobbin bottom holding lever				
Suction shutter for yarn from top bobbin hole				
Yarn end finder miss bobbin separator				
CBF exit lever		YEF1/YEF2 separator	CBF exit lever	Beater *a
Beater *a				

*a, *b is present on some specifications.

Layout of Solenoid Valves for Blast



Link Coner	Bobbin Tray			
Cop-Robo x 1	**1 yarn type: Cop-Robo x 2**		**2 yarn type: Cop-Robo x 2**	
	Machine front	**Machine rear**	**Machine front**	**Machine rear**
Lever blast for spandex *a				
Vortex nozzle				
Cop-Robo blow up nozzle				

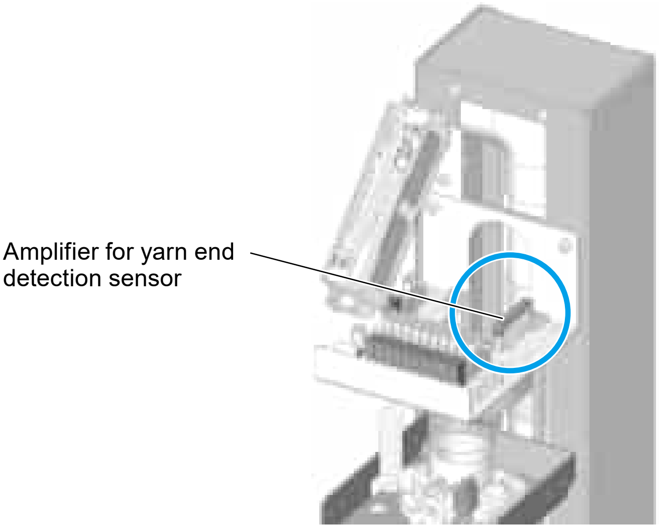
*a is present on the spandex specifications.

Sec 2 Adjustment Standard

2-1 Settings for Yarn End Detection Sensor

When the yarn end find operation is completed, the yarn end detection sensor determines if the operation was successful.

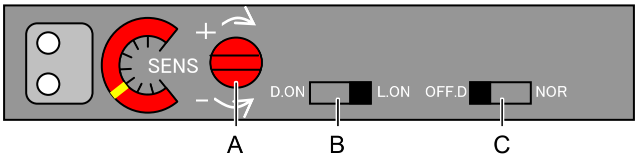
If the yarn end is detected, the bobbin is sent off. If the yarn end is not detected, the operation is repeated on that bobbin (the number of attempts can be set between 3 and 5).


Amplifier for yarn end detection sensor

Setting Each Switch

Sensitivity adjustment dial (A)	Set the sensitivity level to the 3/8 position
Light ON/Dark ON selector switch (B)	Turn the light ON (L.ON)
Timer switch (C)	Set the timer switch to OFF Delay (OFF.D)

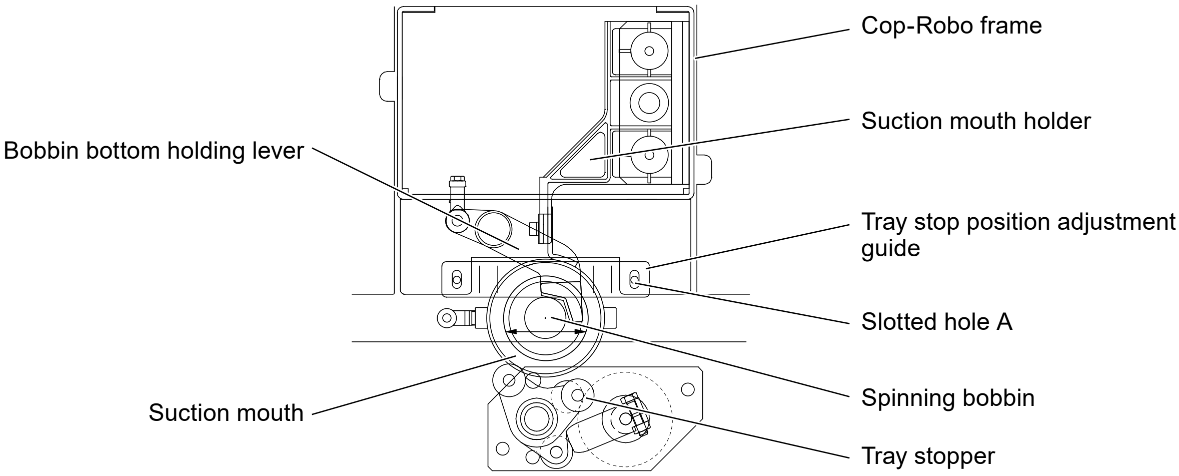
* Some on-site adjustments may be needed depending on types of colored yarns and cotton counts.


SENS
+
-
D.ON
L.ON
OFF.D
NOR
A
B
C

2-2 Centering Tray Stop Position & Suction Pipe

Centering Tray Stop Position

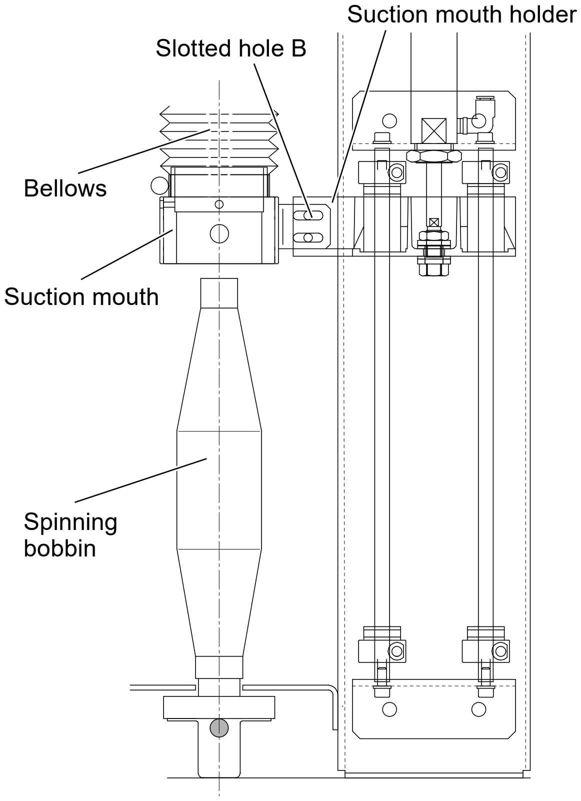
To adjust the tray stop position, move the guide forward or backwards in the slotted hole A. Adjust the guide so that the tray stop position falls in the center of the suction mouth.


Cop-Robo frame
Suction mouth holder
Bobbin bottom holding lever
Tray stop position adjustment guide
Slotted hole A
Spinning bobbin
Suction mouth
Tray stopper

Centering Suction Pipe

1. **Center the suction pipe using the slotted hole B on the mounting section of the suction mouth.**

2. **Adjust it so that the center of the suction mouth is aligned with the center of the spinning bobbin.**

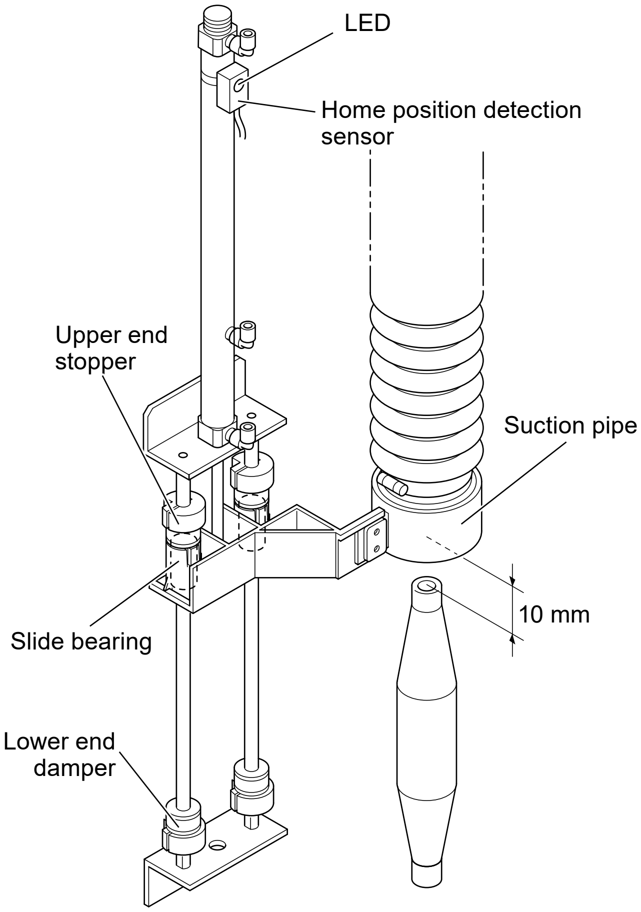

Suction mouth holder
Slotted hole B
Bellows
Suction mouth
Spinning bobbin

2-3 Positioning the Upper End of the Suction Pipe

1. **Fix the upper end stopper in a position such that the gap between the bobbin and the suction pipe is 10 mm.**

   The position at which the upper end stopper is fixed will be the home position for the cylinder.

2. **While the cylinder is in its home position, adjust the sensor position so that the LED for the home detection sensor will turn ON.**

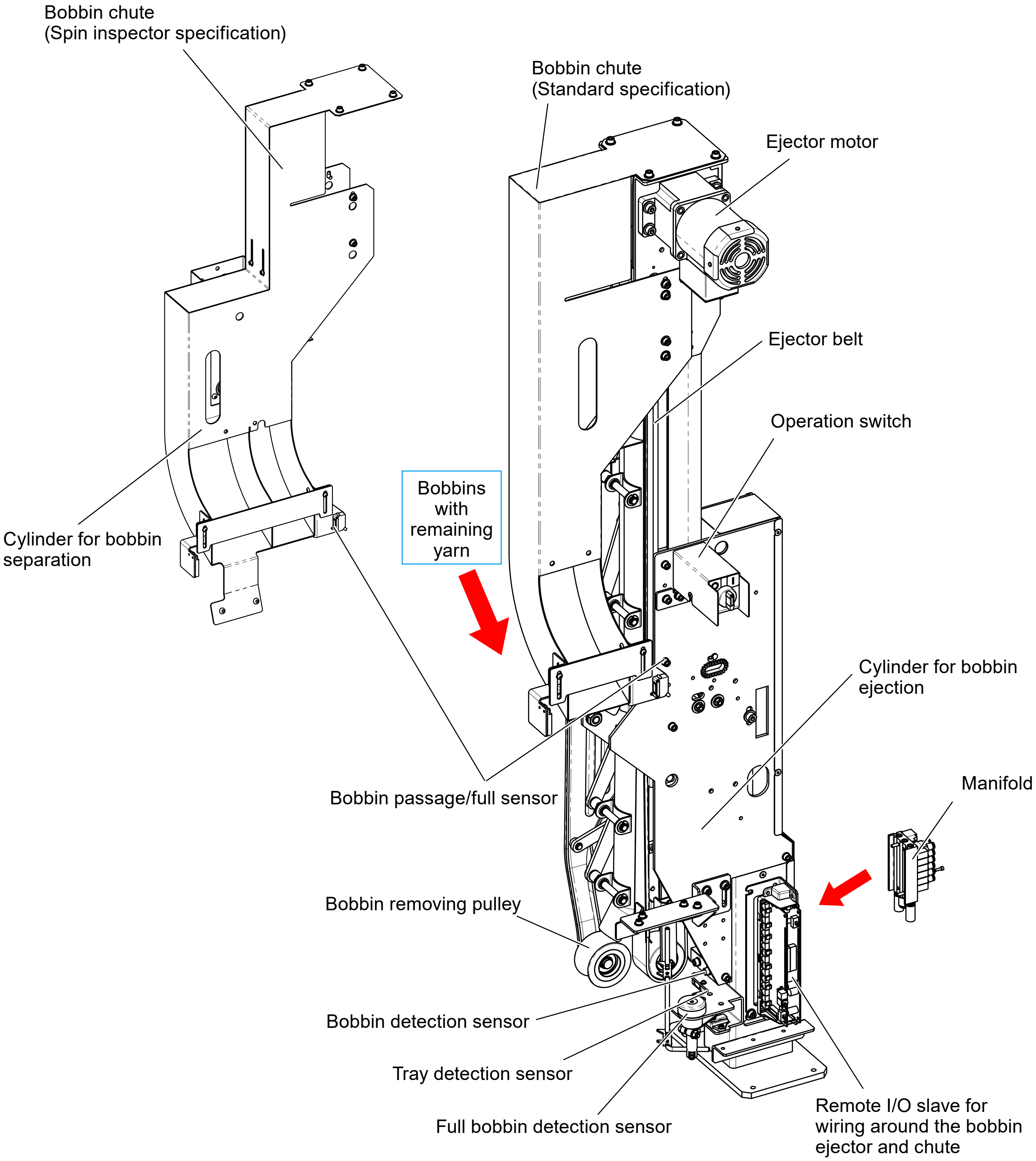

LED
Home position detection sensor
Upper end stopper
Suction pipe
10 mm
Slide bearing
Lower end damper

Chapter 8Fc Bobbin Ejector (for Bobbin Exchanger)

Sec 1 External view & names of each part

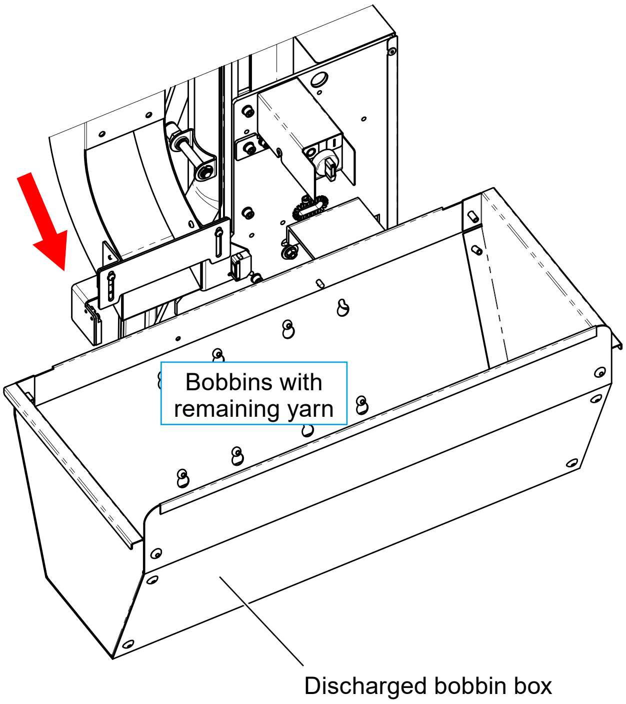
The bobbin ejector is a device which ejects bobbins with remaining yarn below the designated amounts, bobbins with remaining yarn for which the yarn end could not be found, defective bobbins (BQC), etc. from the tray and sorts and recovers each type of bobbin.

1-1 General view of the bobbin ejector

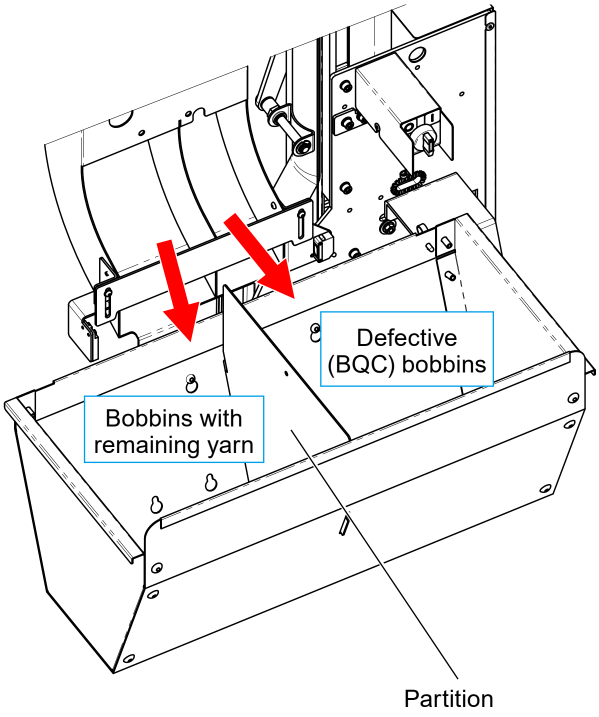

Bobbin chute
(Spin inspector specification)
Bobbin chute
(Standard specification)
Ejector motor
Ejector belt
Operation switch
Cylinder for bobbin separation
Bobbins with remaining yarn
Cylinder for bobbin ejection
Manifold
Bobbin passage/full sensor
Bobbin removing pulley
Bobbin detection sensor
Tray detection sensor
Full bobbin detection sensor
Remote I/O slave for wiring around the bobbin ejector and chute

1-2 Discharged bobbin box

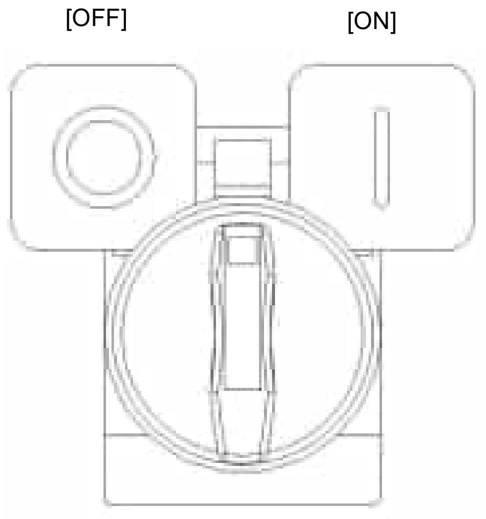
[Standard specification]


Bobbins with remaining yarn
Discharged bobbin box

[Spin inspector specification]


Defective (BQC) bobbins
Bobbins with remaining yarn
Partition

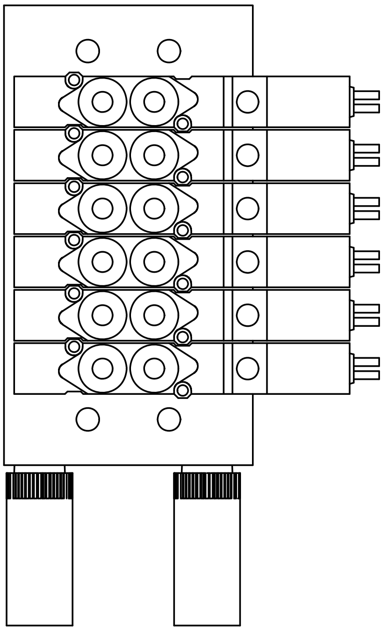
1-3 Operation switch



ON	Relevant bobbins are ejected by the bobbin ejector.
OFF	Relevant bobbins are not ejected by the bobbin ejector, and continue to pass as normal.

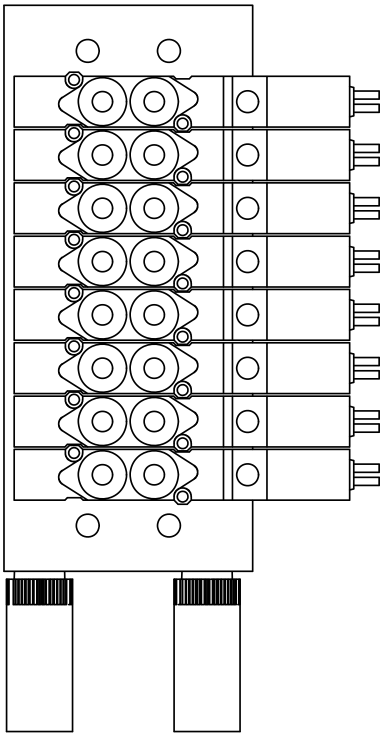
1-3 Solenoid valve (SV) layouts

[Standard specification]



Tray separator
Bobbin ejection clamp
Empty bobbin feeder
Empty bobbin orientation control
Remaining yarn brush blast
Empty bobbin chute open/close

[Spin inspector specification]

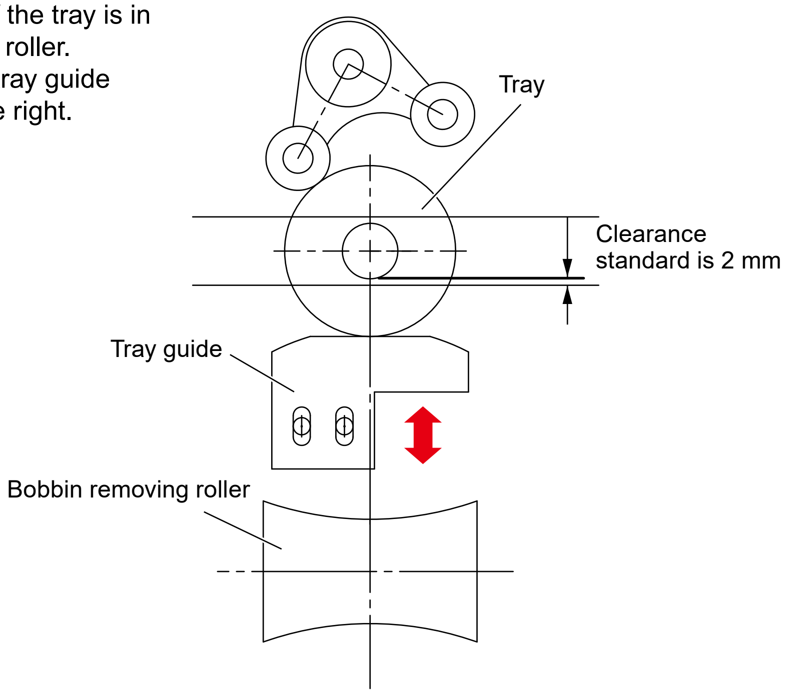


Tray separator
Bobbin ejection clamp
Empty bobbin feeder
Empty bobbin orientation control
Remaining yarn brush blast
— — — — — — — — —
Empty bobbin chute open/close
Discharged bobbin separator

Sec 2 Adjustment standard

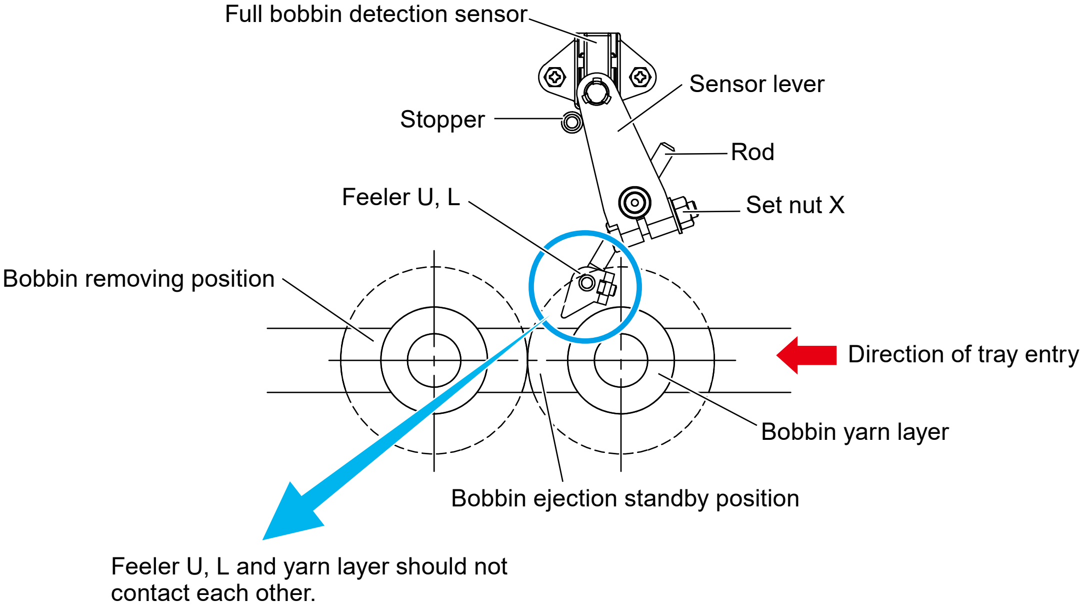
2-1 Tray guide

Adjust the tray guide position so that the centerline of the tray is aligned with that of the bobbin removing roller.
After adjustment, verify that the centerline of the tray is in fact aligned with that of the bobbin removing roller.
If they are not aligned, move and adjust the tray guide following the arrows as in the diagram on the right.


Tray
Clearance standard is 2 mm
Tray guide
Bobbin removing roller

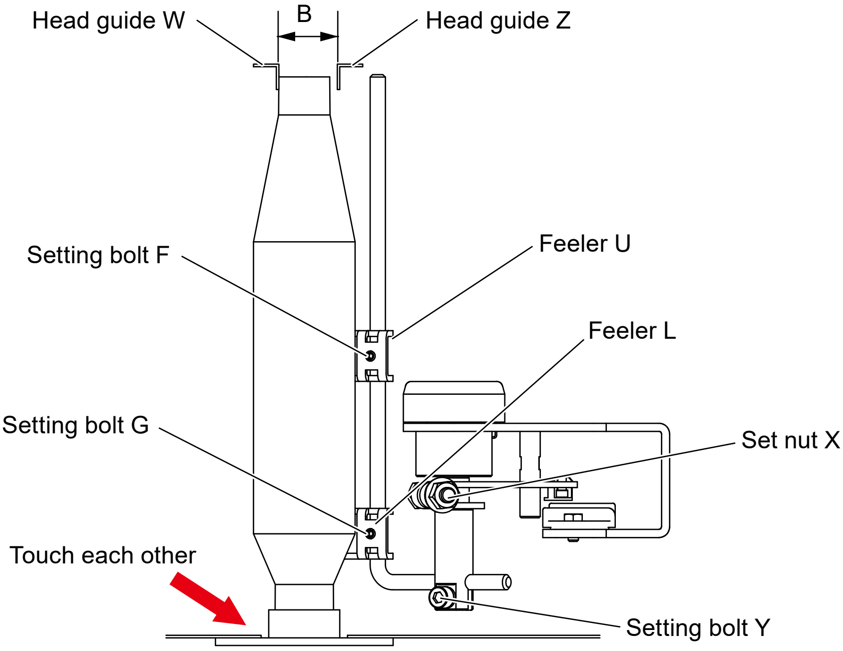
2-2 Full bobbin detection feeler

* Detects spinning bobbins which can be wound based on the amount of remaining yarn on the bobbins. The full bobbin detection feeler determines if the bobbins have any yarn remaining. Adjust the feeler, following the procedure below, to avoid a feeler malfunction or any potential errors.


Full bobbin detection sensor
Sensor lever
Stopper
Rod
Feeler U, L
Set nut X
Bobbin removing position
Direction of tray entry
Bobbin yarn layer
Bobbin ejection standby position

Feeler U, L and yarn layer should not contact each other.

1. **Stop the CBF.**
2. **Adjust so that the tray from the upstream side with full bobbins contacts the tray in the bobbin ejection position.**
3. **Loosen set nut X and tilt the rod towards the bobbin downstream side. Temporarily fix using set bolt Y and set bolts F and G at the position where the top and bottom feelers do not contact the bobbin yarn layer.**
4. **Fix head guide W at the position where it contacts the empty bobbin.**
5. **Adjust the position so that the clearance (B) with head guide Z is + 2 to 3 mm of the bobbin head outer diameter and fix.**

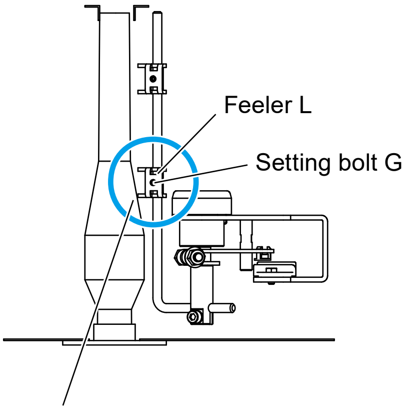


6. **Prepare a minimal remaining yarn bobbin (a bobbin with a minimal yarn amount for which the end can be found in Cop-Robo, etc.) which you do not want to be extracted as in Example 1 and 2. Align the position so that when the bobbin moves to the ejection position feeler L is triggered, and the full bobbin detection sensor turns OFF momentarily, then use set bolts G, X, and Y to fix.**

   * After fixing, check that the feeler does not contact the yarn layer at the bobbin ejection standby position.

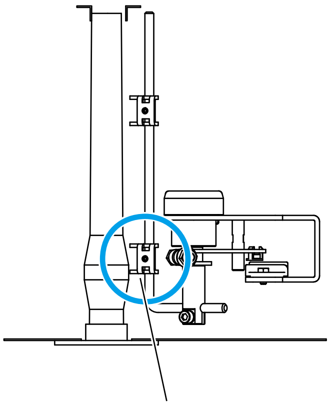
7. **To prevent ejection of irregularly shaped bobbins as in Example 3, align the position so that when the bobbin moves to the ejection position feeler U is triggered, and the full bobbin detection sensor turns OFF momentarily, then use set bolt F to fix.**

[Example: 1] Half-full ejection



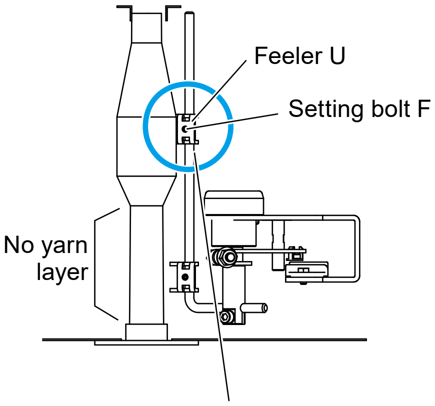
Position so that feeler L is close to the center of the half-full yarn layer taper.

[Example: 2] Minimal full ejection



Position so that feeler L is close to the outmost part of the minimal full yarn layer taper.

[Example: 3] Irregular shaped bobbin ejection prevention



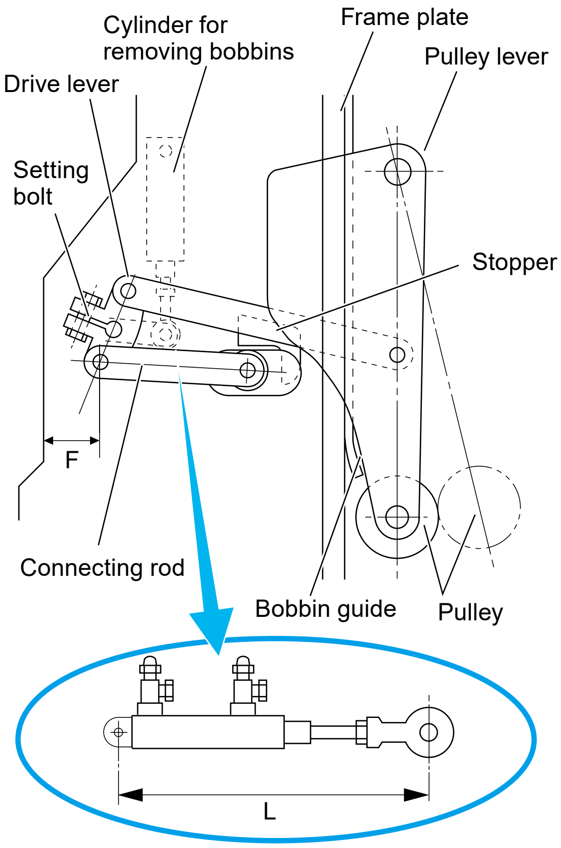
Position feeler U so that it is on the yarn layer on the bobbin top to avoid erroneous detections of minimal remaining yarn.

2-3 Bobbin removing drive part

1. **Make sure that distance F (between the center of the connecting rod mounting hole and the end of the frame plate) is 43 mm and then tighten the setting bolt.**

2. **Ensure that the side of the bobbin guide is parallel to the frame plate when the bobbin removing cylinder is in operation, and then fix the stopper in place.**

3. **Adjust the length of the cylinder rod's end (for the bobbin removing cylinder) so that L = 210 mm when the cylinder has been fully extended.**

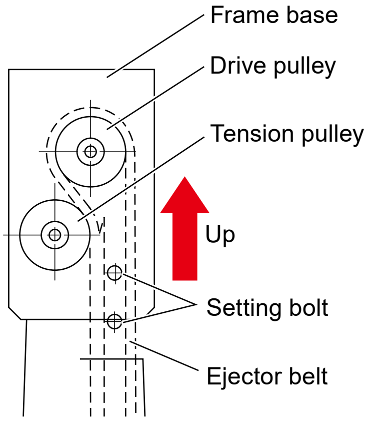

Cylinder for removing bobbins
Frame plate
Pulley lever
Drive lever
Setting bolt
Stopper
F
Connecting rod
Bobbin guide
Pulley
L

2-4 Ejector belt

1. **Loosen the setting bolt and move the frame base vertically to adjust the tension in the ejector belt.**

2. **Adjust so that it rotates without the belts and pulleys slipping or coming loose.**

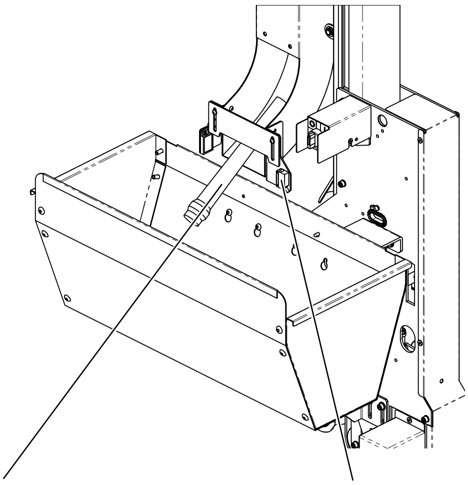
* The overall belt tension ratio is 0 %.


Frame base
Drive pulley
Tension pulley
Up
Setting bolt
Ejector belt

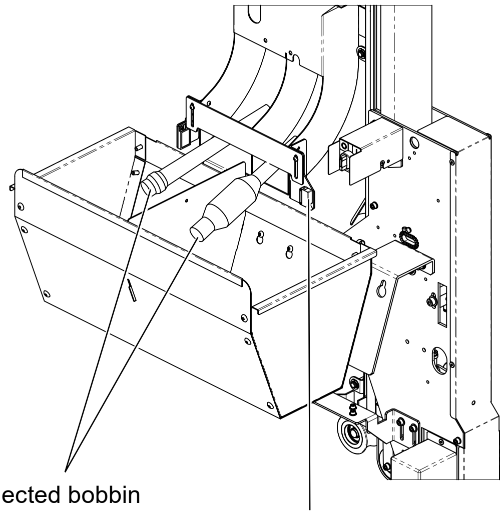
2-5 Discharged bobbin sensor

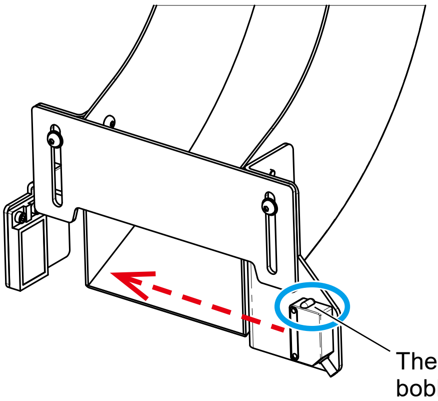
1. **Loosen the fixing bolts and adjust the bobbin detection sensor orientation so that when discharged bobbins pass by the sensor detects them (LED lights up).**

[Standard specification]


Ejected bobbin
Bobbin detection sensor

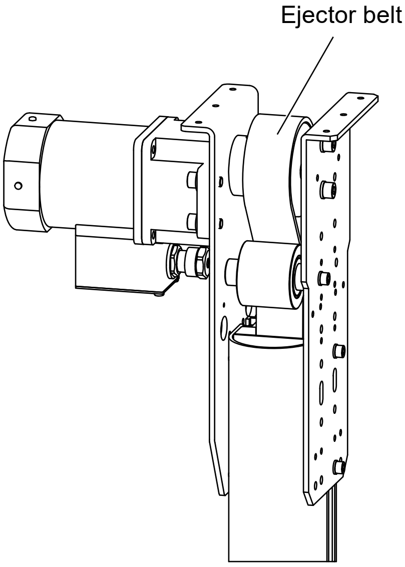
[Spin inspector specification]

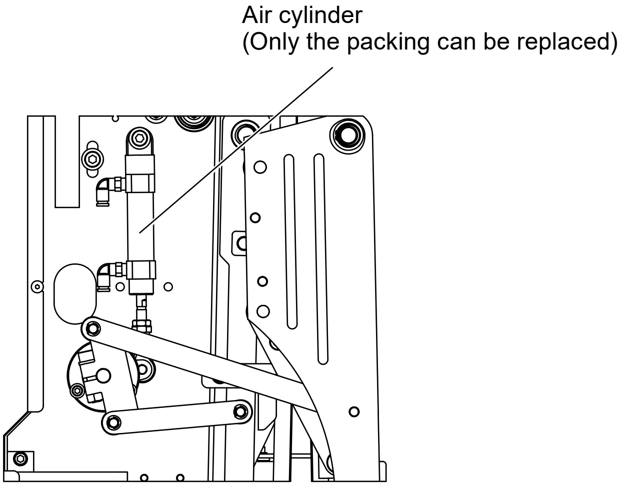

Ejected bobbin
Bobbin detection sensor


The LED will light up orange when a bobbin is detected.

Sec 3 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.


Ejector belt


Air cylinder
(Only the packing can be replaced)

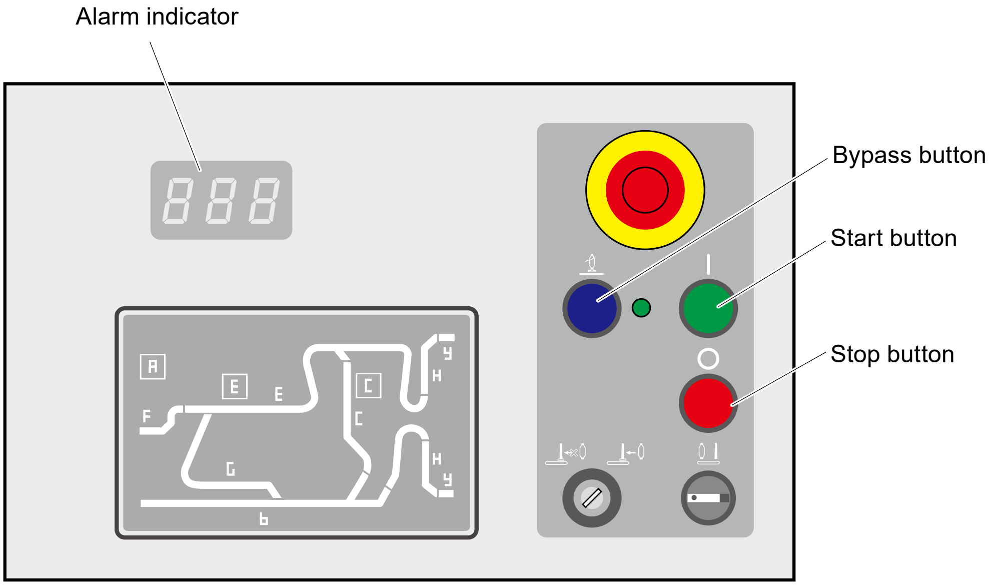
Chapter
8T

Troubleshooting

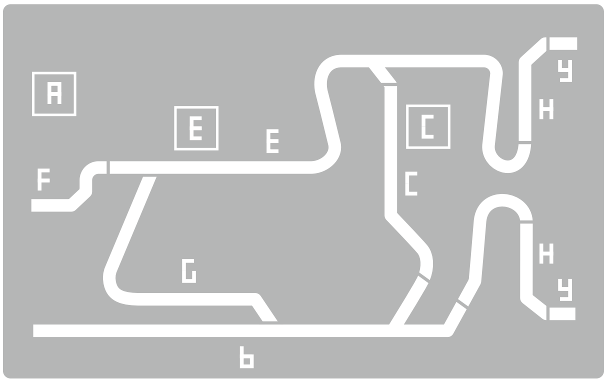
Sec 1 Alarm List

The following is a description of the possible errors that could occur during operation and the countermeasures for them.

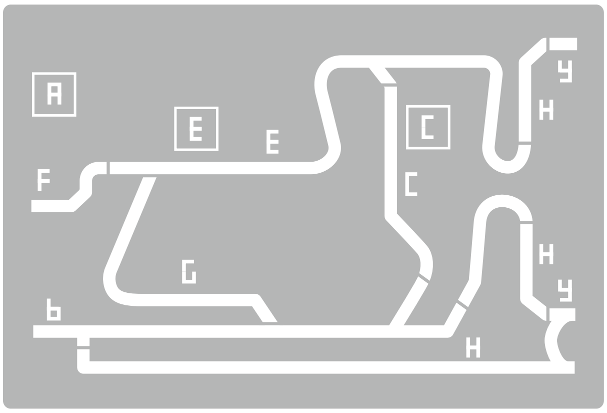
* The alarm no. will be displayed in the alarm indicator on the CBF operation panel.



Alarm indicator
Bypass button
Start button
Stop button


A
E
E
C
C
F
G
H
y
H
y
b

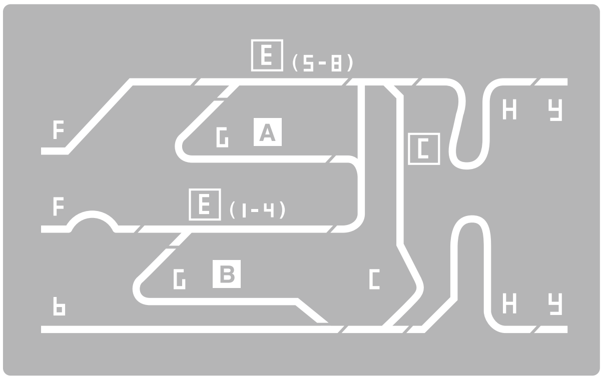
Link Coner for Cop-Robo×1
(Bobbin stripper)


A
E
E
C
C
F
G
H
y
H
y
b
H

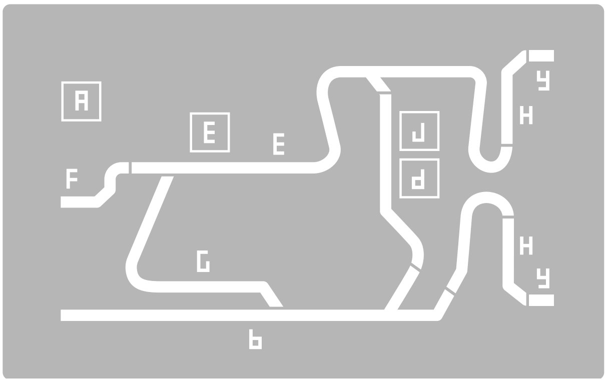
Link Coner
(with spin inspector conveyor)

[Alarm location]

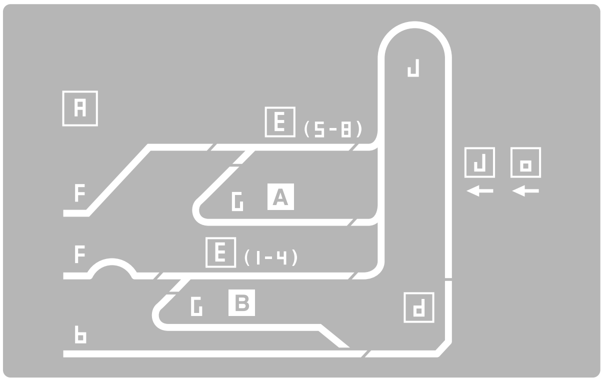
A : Electricity-related
b : Return conveyor
C : Bobbin stripper
d : Bobbin ejector
E : Yarn end finder
F : After yarn end finder (feed conveyor)
G : Bypass line
H : Link conveyor
J : Chute part
L : Chute part (at the back of the machine)
o : Supply part
P : Supply part (at the back of the machine)
U : Steam setter
y : Spinning frame (for Link Coner only)


E (5-8)
F
G
A
C
H
y
F
E (1-4)
G
B
C
b
H
y

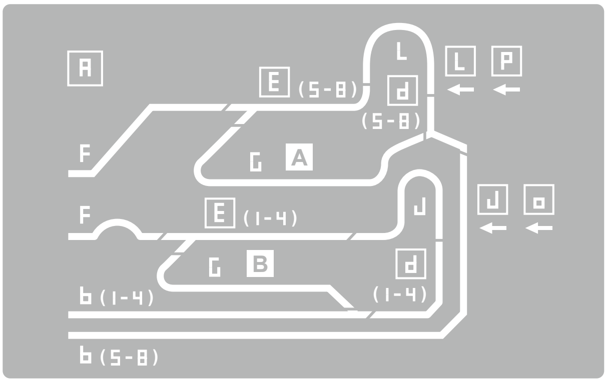
Link Coner for Cop-Robo × 2
(Bobbin stripper)


A
E
E
J
d
F
G
H
y
H
y
b

Link Coner for Cop-Robo × 1
(Empty bobbin supply device)


J
A
E (5-8)
J
o
F
G
A
F
E (1-4)
G
B
d
b

Bobbin Tray for 1 yarn type: Cop-Robo × 2


A
L
L
P
E (5-8)
d
(5-8)
F
G
A
J
o
F
E (1-4)
J
G
B
d
b (1-4)
(1-4)
b (5-8)

Bobbin Tray for 2 yarn types

A: Electricity-related (A5: Front side of the machine, A6: Back side of the machine)

No.	Alarm name	Description	Countermeasures
A1	DC24V Power Error	The 24 V DC power supply in the CBF control box is faulty	- Check the condition of the LED1C of the printed circuit board in the control box * Check if there is a short circuit failure in the wiring when LED is turned OFF
A2	CAN Comm. Err	CAN (lower order) communication error	- Check the VOS alarm screen to find the alarm location - Check the wiring for the fiber SPC and to each slave (power supply lines and communication line), and check the slave switch
A3	PC LINK Comm. Err	CAN (upper order) communication error	- Check for cable connector, pin and other disconnections - Check to make sure that the power is supplied to the fiber SPC
A4	Conveyor Thermal Trip	An overload or open-phase has occurred in the return conveyor, feed conveyor, or link conveyor due to yarn dragging or some other reason	- Check the motor and belts, and remove the cause of the trip. Then reset the thermal relay - If the return conveyor is an inverter specification, check the contents of the inverter alarm and reset it
A5 A6	Yarn End Find Thermal Trip	An overload or open-phase has occurred in the yarn end finder motor (for the searcher spindle and rotary cutter, as well as the spindle, CBF, and conveyor)	Check the motor and belts, and remove the cause of the trip. Then reset the thermal relay.
A7	Remote I/O Output Error	An output error has occurred at the slave or SPC	- Check the VOS alarm screen to find the alarm location - Remove the cause and turn the circuit breaker OFF/ON (Replace the circuit board if the alarm is still ON)
A8	Emergency Stop	The CBF emergency stop switch has been pressed	Perform a safety check and after releasing the switch, press the CBF start button. * Even when the CBF power supply is down, an emergency stop alarm will also be displayed on the VOS (but not displayed on the indicator). A communication alarm will also be displayed on the VOS at the same time.

b: Return conveyor (b1~b4: Front side of the machine, b5~b6: Back side of the machine)

No.	Alarm name	Description	Countermeasures
b1 b5	TrayFull atReturnC/V	The full of trays sensor for the return conveyor is ON	The trays that are returned are in excess of the processing capability of the CBF. Wait for the CBF to process the trays.
b2 b6	Tray Jam in Empty Line	A tray is jammed in the return conveyor due to yarn dragging or some other reasons	Remove the cause and press the CBF start button
b4	Jam After Ret. C/V Ejec	Tray is jammed after it was discharged at the empty line	Remove the cause and press the CBF start button

C: Bobbin stripper

No.	Alarm name	Description	Countermeasures
C1	Stripper Sensor Err	The home position for suction shutter is OFF	Check the cable disconnection, air leaks, sensor malfunction, and stripper for adjustment. Remove the cause. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.
C2	Bobbin Come Off	The bobbin was removed from the tray during the stripper operation	Check stripper for adjustment. Remove the cause. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.
C5	Cylinder Alarm	There is a cylinder error on the stripper. An alarm occurred due to a lower end sag, or due to an upper/lower end sensor detection error.	Check air leaks, sensor malfunction, and stripper for adjustment. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.
C6	Tray Dischrg Failure	Tray was not ejected properly at the stripper	Remove the cause. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.
C7	Tray Jammed After Stripper	Tray is jammed after stripper	Remove the cause. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.
C8	Tray Jam Before Stripper	Tray is jammed before stripper	Remove the cause. Set the stripper mode switch to the bypass mode temporarily and press the CBF start button. Then set it back to the automatic operation mode.

d: Bobbin ejector (d1~d4: Front side of the machine, d5~d8: Back side of the machine)

No.	Alarm name	Description	Countermeasures
d1 d5	Bobbin Removal Failure	Bobbin was not removed at the bobbin ejector	- Make sure that a matching tray is used for the bobbin - Check if the belt is worn - If the belt does not rotate, check the motor
d2 d6	Bobbin Jam Inside Ejector	The passage check sensor does not turn ON even 3 seconds after the bobbin is removed	- Check if a bobbin is jammed near the passage check sensor inside the bobbin ejector - Check the sensor if an alarm occurs even when there is no jammed bobbin
d3 d7	Ejctr Peripheral Tray Blck	1) The tray detection sensor remains ON even after the feed solenoid operates three times repeatedly 2) The tray detection sensor at the bobbin ejector is OFF, and the full of trays detection sensor is ON at the same time. 3) Even though four trays are fed from the bobbin ejector, the full of trays detection sensor does not turn ON at the supply part chute position.	1) Check if a bobbin with yarn is stuck to the bobbin ejector at the bobbin removing position. If an alarm occurs even when there is no problem, check the tray detection sensor and the feed solenoid 2) Check if a bobbin is stuck to the bobbin pusher guide or the full bobbin detection feeler 3) Check if there is a yarn dragging between the bobbin ejector and the chute part, and remove the cause. If this alarm occurs frequently even when there is no jammed tray, check if the feed solenoid in the bobbin ejector and the full of bobbins detection sensor in the chute position detect a tray correctly. * Readjust the device that has a problem to remove the cause of any tray jam
d4 d8	Emp Bobbin Transport Error * This alarm will not be displayed if the setting of the "Empty bobbin return" is "Without" on the VOS screen.	A problem occurred at the empty bobbin conveyance device.	Check if the empty bobbin conveyance device is working correctly

E: Yarn end finder (E1~E4: Front side of the machine, E5~E8: Back side of the machine)

No.	Alarm name	Description	Countermeasures
E1 E5	Mouth moved off home pos	Cop-Robo mouth is not in the home position	Check the air pressure and home position sensor
E2 E6	Bobbin Removal Alarm	A bobbin is missing at the Cop-Robo mouth.	- Check bobbin holder for adjustment - Press the CBF stop button, and remove the bobbin. Then press the CBF start button.
E3 E7	Tray Jam at YEF	A tray is jammed either at the rotary cutter or the searcher part	Remove the cause
E4 E8	Tray Jam Before YEF	A tray is jammed right before the rotary cutter	Remove the cause

F: After yarn end finder (feed conveyor)

No.	Alarm name	Description	Countermeasures
F1	Tray Jam at CBF Exit	A tray is jammed at the CBF exit	Remove the cause
F2	Tray Jam At Feed C/V	A tray is jammed on the back side of the winding unit and at the feed conveyor	Remove the cause

G: Bypass line (G1~G2: Front side of the machine, G5~G6: Back side of the machine)

No.	Alarm name	Description	Countermeasures
G1 G5	TrayFull inBypassLine	The bypass line is full of trays	Process the yarn tip, and press the bypass button
G2 G6	3-min Alarm Actvtn in Bypass	A large number of bobbins with yarn end finding errors have occurred	Process bobbins in the bypass line, and press the bypass button

H: Link conveyor

No.	Alarm name	Description	Countermeasures
H1	*Spin Inspector Tag Error Alarm	Defective tag detected at reading station	Remove defective tag tray
H2	Empty Line Related Error	A problem has occurred at the return conveyor of the link part	Remove the cause
H3	FullBobbin Related Error	A problem has occurred in the feed conveyor of the link part	Remove the cause
H4	*CBFSpeCntlBoard Alm	An alarm has occurred at the control box mounted for CBF special specifications	Check the cable outlets, such as the thermal trip and power supply connector as well as the switch setting for each printed circuit board.
H5	*YrnWasteRmv Eqp Alm	An alarm has occurred at the yarn waste removal device	Check the jammed tray and the cylinder out of home position.
H6	*Jam in Spin INS Buffer C/V	A tray is jammed in the spin inspector buffer conveyor	Remove the cause
H7	*Spin Inspctr Bffr C/V Thrml Trp	An overload or open-phase has occurred in the spin inspector buffer conveyor	Check the motor and belts, and remove the cause of the trip. Then reset the thermal relay.
H8	*Spin inspector Alarm	Check the tray detection sensor for the spin inspector	- Check the yarn dragging and tray guide for adjustment - Remove the cause

* Depending on the specifications, these may not be displayed.

J: Chute part (Front side of the machine), L: Chute part (Back side of the machine)

No.	Alarm name	Description	Countermeasures
J1 L1	Discharge Error at Chute	A tray feed error has occurred at the chute part	Remove the cause
J2 L2	Bobbin Chute Error	A chute error has occurred	Check the chute guide and the top/bottom judgement part
J4 L4	Tray Jammed before Chute	A tray is jammed before the chute part	Check the yarn dragging and the tray flow
J6 L6	Tray Jammed after Chute	A tray is jammed after the chute part	Check the yarn dragging and the tray flow

o: Supply part (Front side of the machine), P: Supply part (Back side of the machine),

[Parts feeder]

No.	Alarm name	Description	Countermeasures
o1 P1	Pump Motor Alarm	The pump motor is continuously running	Check the top end and bottom end of the hoist
o2 P2	Vibrating Feeder Motor Alarm	There is an inverter alarm for the vibrating feeder or a thermal trip	- Check the inverter alarm code and the motor load - Remove the cause and press the reset switch on the inverter
o3 P3	Supply Part Motor Alarm	An overload or open-phase has occurred at the supply part motor	- Check the thermal relay in the supply part control box - Check the load of the tripped motor
o4 P4	Bobbin Jammed on Pusher	A bobbin is jammed on the pusher	Remove the cause
o5 P5	Pusher Alarm	A bobbin is caught between pushers	- Remove the cause - Check pusher for adjustment. - Check the pusher operation detection sensor
o6 P6	Jam at Parts Feeder Exit	A bobbin is jammed at the parts feeder exit	Remove the cause
o7 P7	Bobbin Ejector Thermal Trip	An overload or open-phase has occurred at the bobbin ejector motor	- Check the thermal relay in the supply part control box - Check the bobbin ejector or the return conveyor motor
o8 P8	Emergency Stop	The CBF emergency stop switch is pressed at the supply part	Check the emergency stop switch located below the operating panel or the doffing box

[Vertical conveyor feeder]

No.	Alarm name	Description	Countermeasures
o1 P1	Bobbin Inlet is Clogged	A bobbin is clogged at dam part, or below vertical conveyor	- Remove the cause - Check bobbin detection sensor for adjustment
o2 P2	Vertical Conveyor Alarm	A bobbin is clogged on the vertical conveyor	Remove the cause
o3 P3	Supply Part Thermal Trip	Overload, phase interruption in bobbin ejector motor or residual-yarn ejector conveyor motor	- Check the thermal relay in the supply part control box - Check bobbin ejector or residual-yarn ejector conveyor motor
o4 P4	Bobbin Jammed on Pusher	A bobbin is jammed on or before pusher	- Remove the cause - Check bobbin detection sensor for adjustment
o5 P5	Pusher Alarm	A bobbin is caught between pushers	- Remove the cause - Check pusher for adjustment - Check pusher operation detection sensor
o6 P6	1 standby position bobbin stuck	A bobbin is clogged near single bobbin standby position	- Remove the cause - Check bobbin detection sensor for adjustment
o7 P7	Rotor Alarm	The home position for rotor is OFF	- Remove the cause - Check home position sensor for adjustment
o8 P8	Bunch Remover Alarm	- The home position for bunch remover is OFF - A bobbin is clogged in the bunch remover	- Remove the cause - Check home position sensor for adjustment

U: Steam setter

No.	Alarm name	Description	Countermeasures
U1	*Steam Setter Alarm	An error has occurred in the steam setter	Remove the cause
U2	*Setter Request Sig. OFF	A tray cannot be fed because the steam setter request signal is OFF	Remove the cause

* Depending on the specifications, these may not be displayed.

Y: Spinning frame (for Link Coner only)

No.	Alarm name	Description	Countermeasures
Y1	Spinning Frame Error	An error has occurred at the spinning frame	Check the spinning frame
Y2	Jammed at spin. Frame	A tray is jammed at the spinning frame entrance	Check the spinning frame

Sec 2 Troubleshooting

2-1 Cop-Robo

- **When the yarn end find operation does not perform for a full bobbin, but it does for an empty bobbin**

Cause	Countermeasures
There is a full bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor

2-2 Tray Conveyor

- **When the return conveyor motor and the CBF conveyor belt do not rotate**

Symptom	Cause	Countermeasures
Motor operates normally (turns on)	Belt fell off	Remove yarn waste and attach belt
	Belt is slipping	- Remove yarn entangled on pulley - Replace belt if it is stretched
	Belt broke apart	Replace belt
Motor does not operate	Thermal relay tripped	- Check for pulley faults (yarn entanglement or bearing damage) →Remove yarn waste, or replace bearing - Check for motor errors →Replace motor - Check whether a motor connector has been disconnected
	Machine is stopped (normal)	When emergency stop switch has been pressed, release it and press CBF start button
	Maintenance mode is enabled (normal)	Check operation indicator (green LED). If flashing, turn maintenance switch OFF, then press CBF start button.
	Slave force output mode is enabled (normal)	Check CBF alarm indicator. If "¯ ¯“ is displayed, check each slave and cancel force output mode. Then press CBF start button.
	*__Only the return conveyor motor__ Tray conveyor switch is OFF (normal)	Check machine and CBF tray conveyor switch

- **When the tray feed is not working properly**

Cause	Countermeasures
Clogged with yarn waste or cotton fly	Remove yarn waste or cotton fly
Belt is worn	Replace belt
Belt spring guide is warped or bent	Repair warped or bent spring guide

- **When the tray does not return to the spinning frame, the empty bobbin is not ejected by the bobbin ejector, or it does not chute into the empty tray**

Cause	Countermeasures
Lot change mode enabled	Check lot change key

2-3 Bobbin Stripper

- **When the removal operation does not occur even though the bobbin still has yarn remaining on it**

Symptom	Cause	Countermeasures
Tray is ejected without performing removal operation	There is a full bobbin detection sensor error	- Adjust full bobbin detection feeler - Check sensor input If error persists, check connectors or replace sensor
	There is a sensor error for detecting bobbins that need winding	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
Tray stops at removal position	There is a tray detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a tray guide error	Adjust tray guide position
	There is a tray feed solenoid error	- Check solenoid for adjustment - Check solenoid output If error persists, check connectors or replace solenoid
	There is an air pipe fault	Check air piping and replace if necessary

2-4 Bobbin Ejector

- **The removal operation for empty bobbins does not occur**

Symptom	Cause	Countermeasures
Tray is ejected without performing removal operation	There is a full bobbin detection sensor error	- Adjust full bobbin detection feeler - Check sensor input If error persists, check connectors or replace sensor
	There is a bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
Tray stops at removal position	There is a tray detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a tray guide error	Adjust tray guide position
	There is a solenoid valve for removing bobbins error	- Check the operation of the solenoid valve for removing bobbins - Check for air leaks

- **Bobbins are not removal**

Symptom	Cause	Countermeasures
Motor operates normally (turns on)	Belt fell off	Remove entangled yarn and attach belt
	Belt is slipping	Remove entangled yarn and adjust belt
	Belt broke apart	Replace belt
	There is a Cylinder for removing bobbins error	- Check cylinder operation - Check for air leaks
	There is a tray and bobbins error	Check match between tray and bobbin
Motor does not operate	Thermal relay tripped	- Check for pulley faults (yarn entanglement or bearing damage) →Remove yarn waste, or replace bearing - Check for motor errors →Replace motor - Check whether a motor connector has been disconnected

- **When the ejected bobbins are not separated, that is, all the bobbins are either ejected only into the empty bobbin chute, or only into the skinny bobbin (minimal yarn remaining) chute**

Symptom	Cause	Countermeasures
Skinny bobbin ejection cylinder sometimes fails	There is a skinny bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a cylinder error	- Check cylinder for adjustment - Check cylinder operation - Check for air leaks
	There is a Minimal Yarn Detection Brush error	- Check brush for adjustment - Check if brush is worn
Skinny bobbin ejection cylinder operates when necessary	There is a skinny bobbin detection sensor error	Check sensor for adjustment
	There is a Minimal Yarn Detection Brush error	Check brush for adjustment
Skinny bobbin ejection cylinder does not operate at all	There is a skinny bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a cylinder error	- Check cylinder for adjustment - Check cylinder operation - Check for air leaks - Check solenoid valve operation
	There is a Minimal Yarn Detection Brush error	- Check brush for adjustment - Check if brush is worn

- **When the tray is not fed after bobbin removal**

Symptom	Cause	Countermeasures
Supply unit chute is not full	There is a PXS (chute position full with trays) error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a solenoid error on tray feed from bobbin ejector	- Check solenoid for adjustment - Check solenoid output If error persists, check connectors or replace solenoid
	There is a tray guide error	Check guide for adjustment
Supply unit chute is full	Normal	---

- **When the rotating warning light (red) turns on**

Symptom	Cause	Countermeasures
Tray on bobbin ejector is clogged	There is a solenoid error on tray feed from bobbin ejector	- Check solenoid for adjustment - Check solenoid output If error persists, check connectors or replace solenoid
Bobbin fell off near bobbin ejector	There is a bobbin removal drive error	- Check pulley connection for bobbin removal - Check cylinder for adjustment
	There is a bobbin removal guide error	Check bobbin guide connection and positioning adjustment
Bobbin is clogging or blocking bobbin ejector	There is a bobbin removal guide error	Check bobbin guide connection and positioning adjustment
	There is a bobbin ejector motor error	- Check for entangled yarn on pulley - Check belt for adjustment
Cannot find error, but rotating warning light is turned on	There is a passage check sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a tray detection sensor error	Check if cotton fly or yarn waste has been detected

2-5 Hoist

- **When the hoist does not rise even if the raise button is pressed**

Cause	Countermeasures
There is a doffing box detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
There is a bottom end sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
There is an inlet sensor error on vibrating conveyor	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
There is a hydraulic system error	Check the rate of discharge flow, discharge pressure, and amount of the restriction of oil

2-6 Vibrating Conveyor

- **When the vibrating conveyor does not operate even though there are no bobbins inside the parts feeder**

Cause	Countermeasures
There is a parts feeder level sensor error	- Check sensor input If error persists, check connectors or replace sensor

2-7 Parts Feeder

- **When the parts feeder does not operate even though there are no bobbins on the feed roller**

Cause	Countermeasures
There is a bobbin detection sensor error on the feed roller	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor

2-8 Chute

When bobbins are not chuted even though the tray is empty

Cause	Countermeasures
There is a bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor

Pusher does not operate

Symptom	Cause	Countermeasures
Bobbins are waiting on pusher	There is a bobbin detection sensor error on pusher	- Check sensor input If error persists, check connectors or replace sensor
	There is a pusher operation detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
Empty tray is waiting	There is a tray detection sensor	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor

Chute error occurs frequently

Cause	Countermeasures
There is a bobbin top/bottom sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
There is a bobbin top/bottom feeler error	Check bobbin top/bottom feeler for adjustment
There is a bobbin guide error	Check bobbin guide for adjustment
There is a bobbin top/bottom detection lever drive cylinder error	Check air piping
There is a chute guide error	Check air piping

Feed roller does not rotate

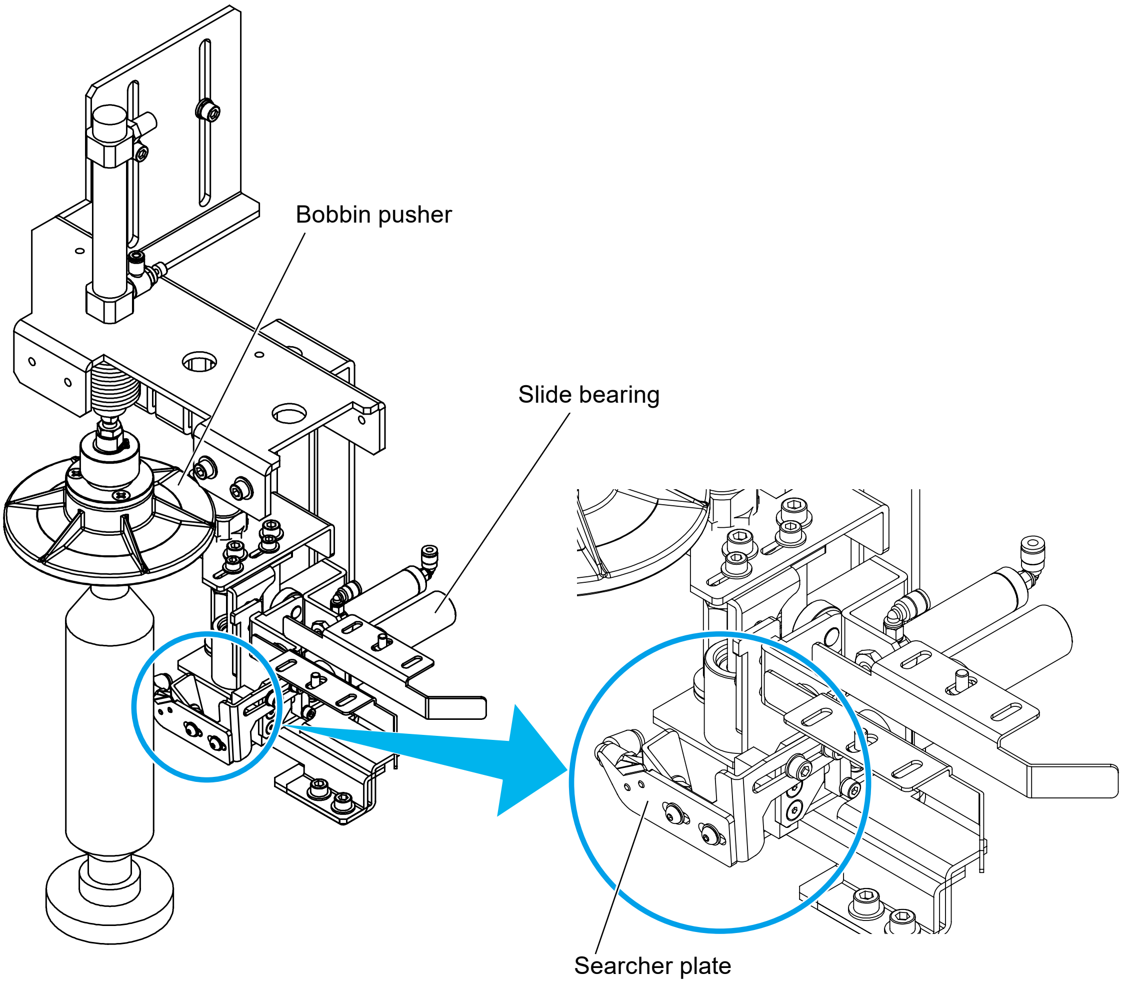
Symptom	Cause	Countermeasures
Motor operates normally (turns on)	Belt fell off	Remove entangled yarn and attach belt
	Belt is slipping	Remove entangled yarn and adjust belt
	Belt broke apart	Replace belt
Motor does not operate	There is A bobbin detection sensor error on pusher	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a feed roller bobbin detection sensor error	- Check sensor for adjustment - Check sensor input If error persists, check connectors or replace sensor
	There is a motor error	Check an overload (entangled yarn, etc.)

Chapter

8W Searcher

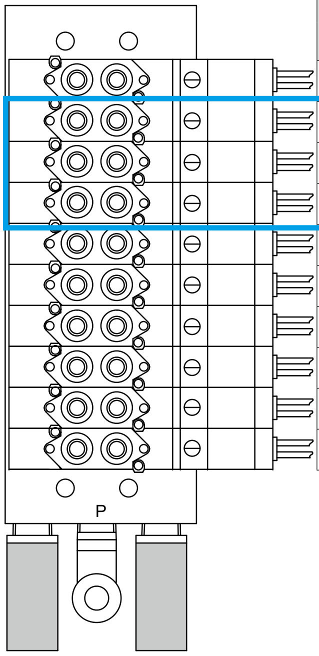
This is a device for pulling the yarn off of the spinning bobbin, and increasing the rate of success of yarn suction on the Cop-Robo.

Names of Each Part


Bobbin pusher
Slide bearing
Searcher plate

Layout of Solenoid Valves for Actuator

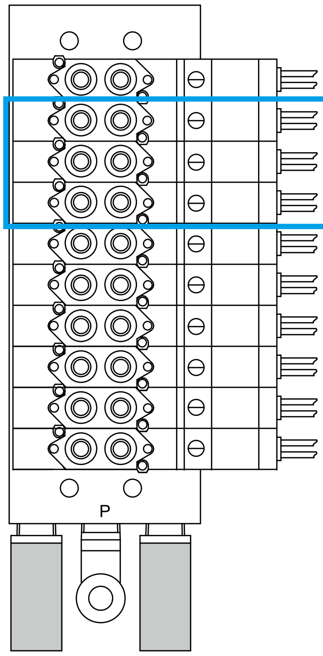
- **Link Coner**



Cop-Robo x 1	Cop-Robo x 2	
	Machine front	Machine rear
Lever for rotary cutter tray rotation *b		
Lever for searcher tray rotation		
Searcher stopper		
Searcher		
Shutter cutter		
Bobbin bottom holding lever		
Suction shutter for yarn from top bobbin hole		
Yarn end finder miss bobbin separator		
CBF exit lever	Lead tray stopper on return conveyor bypass	CBF exit lever
Beater *a		

*a, *b is present on some specifications.

- **Bobbin Tray**



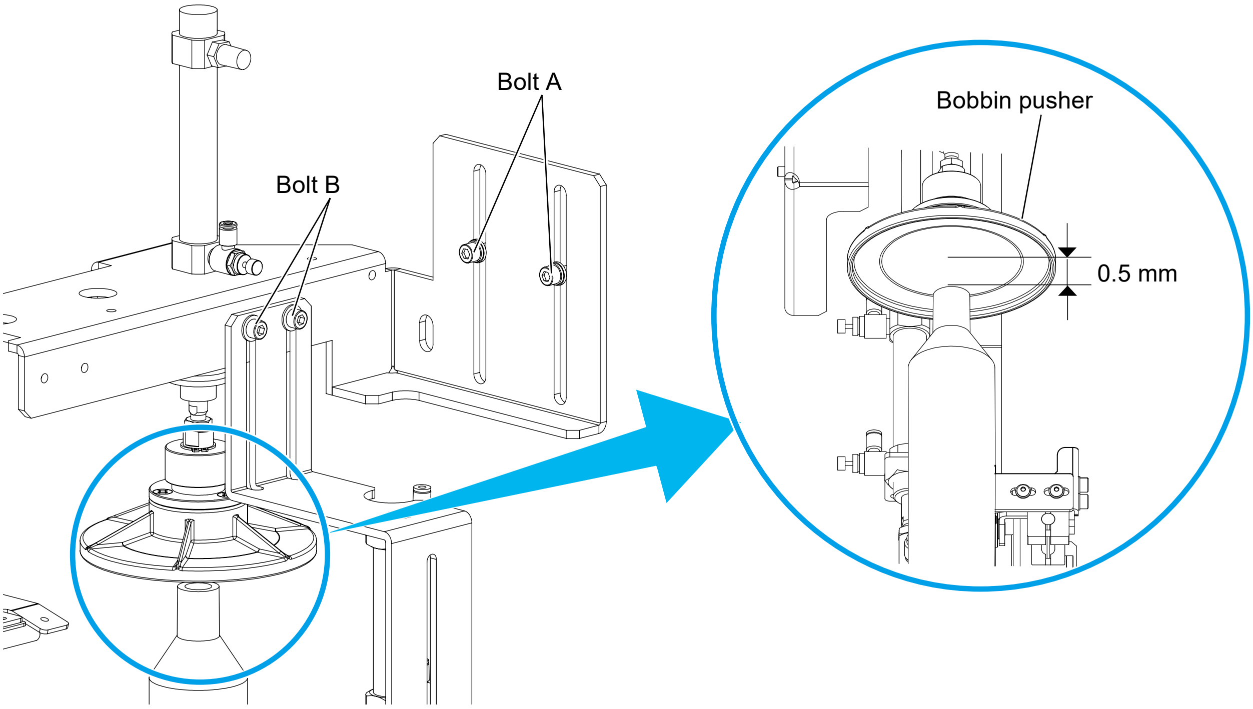
Cop-Robo x 1	1 yarn type: Cop-Robo x 2		2 yarn type: Cop-Robo x 2	
	Machine front	Machine rear	Machine front	Machine rear
Lever for rotary cutter tray rotation *b				
Lever for searcher tray rotation				
Searcher stopper				
Searcher				
Shutter cutter				
Bobbin bottom holding lever				
Suction shutter for yarn from top bobbin hole				
Yarn end finder miss bobbin separator				
CBF exit lever		YEF1/YEF2 separator	CBF exit lever	Beater *a
Beater *a				

*a, *b is present on some specifications.

Sec 1 Adjustment Standard

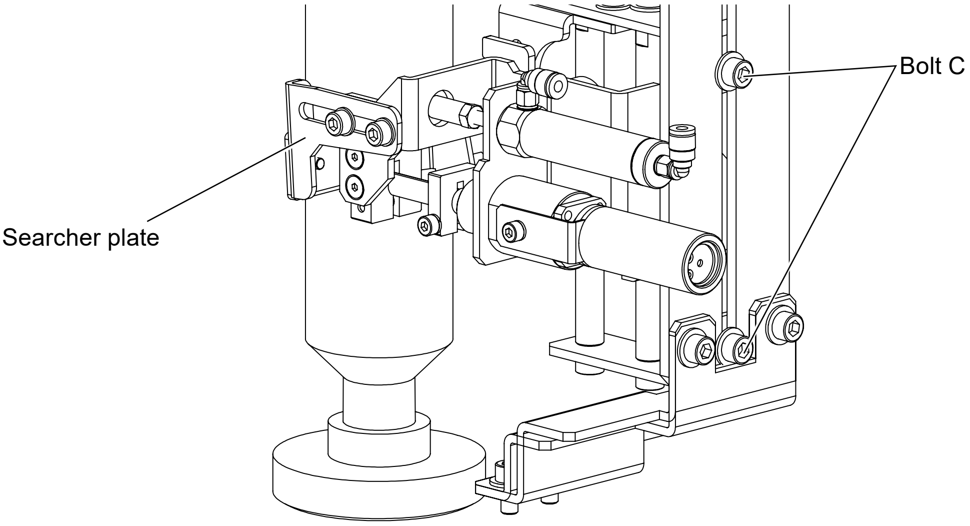
1-1 Height Adjustment on Bobbin Pusher

1. **Loosen bolt A and bolt B while the bobbin pusher is holding a bobbin. Adjust so that there is an approximately 0.5 mm clearance between the center of the bobbin pusher and the bobbin top.**


Bolt A
Bolt B
Bobbin pusher
0.5 mm

1-2 Searcher Vertical Position Adjustment

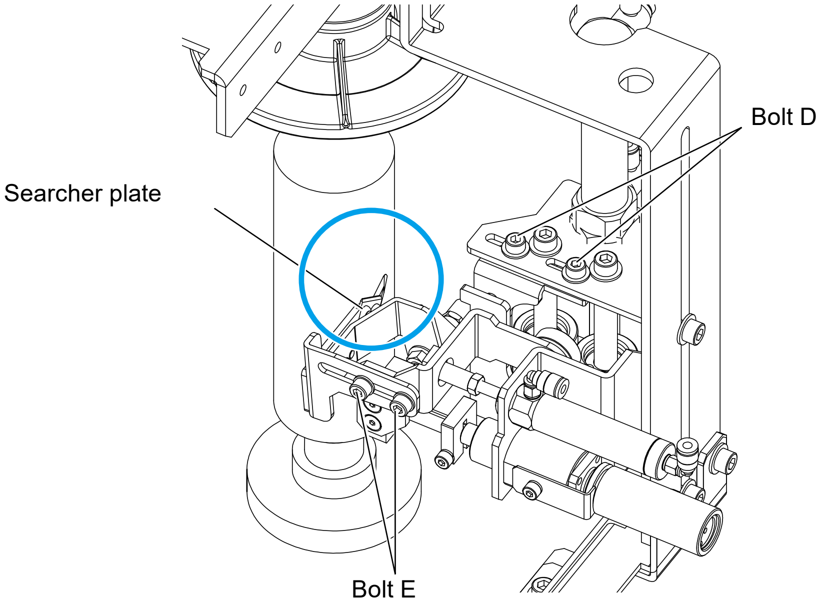
1. **Loosen bolt C and adjust according to the supply bobbin shape to a height at which it is easier for the searcher plate to find the yarn end.**


Bolt C
Searcher plate

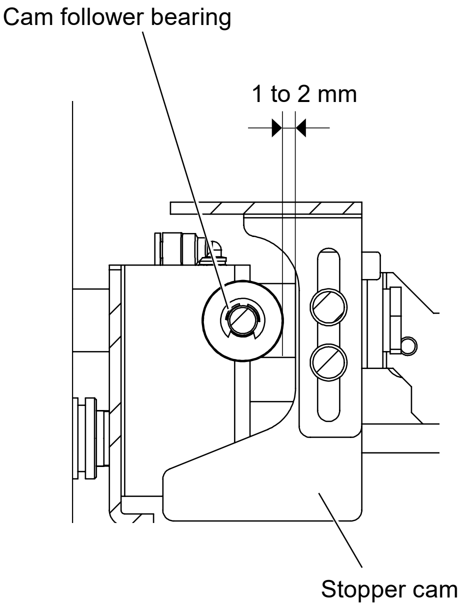
1-3 Searcher Horizontal Position Adjustment

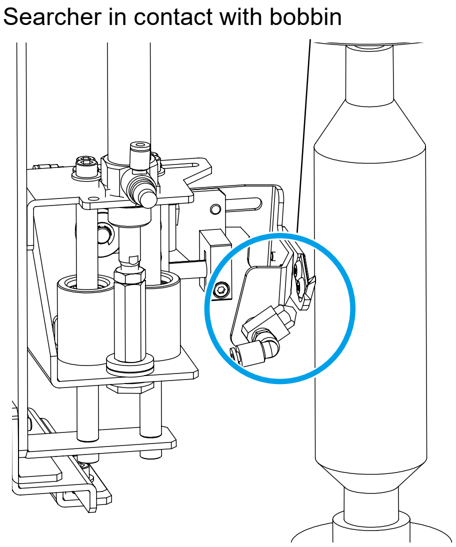
1. **Loosen bolt D and bolt E and adjust so that the tip of the searcher plate contacts the bobbin.**

* Use normal shaped, full bobbins.

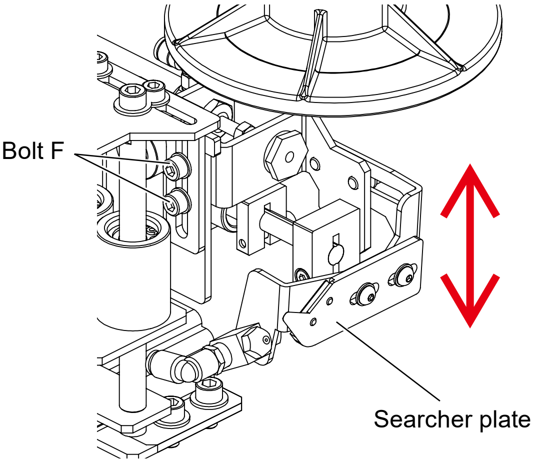

Bolt D
Searcher plate
Bolt E

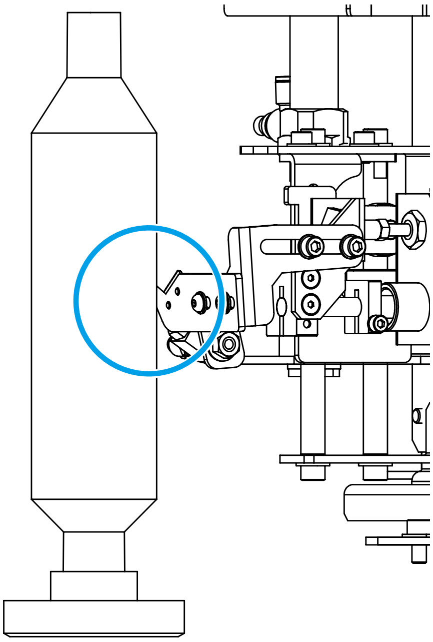
2. **Adjust the stopper cam using bolt D. With the searcher blade edge touching the bobbin, adjust so there is a 1-2 mm clearance between the stopper cam and cam follower bearing.**


Cam follower bearing
1 to 2 mm
Stopper cam


Searcher in contact with bobbin

3. **Move the searcher plate up and down using bolt F and adjust the position so the tip of the searcher plate contacts the bobbin.**


Bolt F
Searcher plate

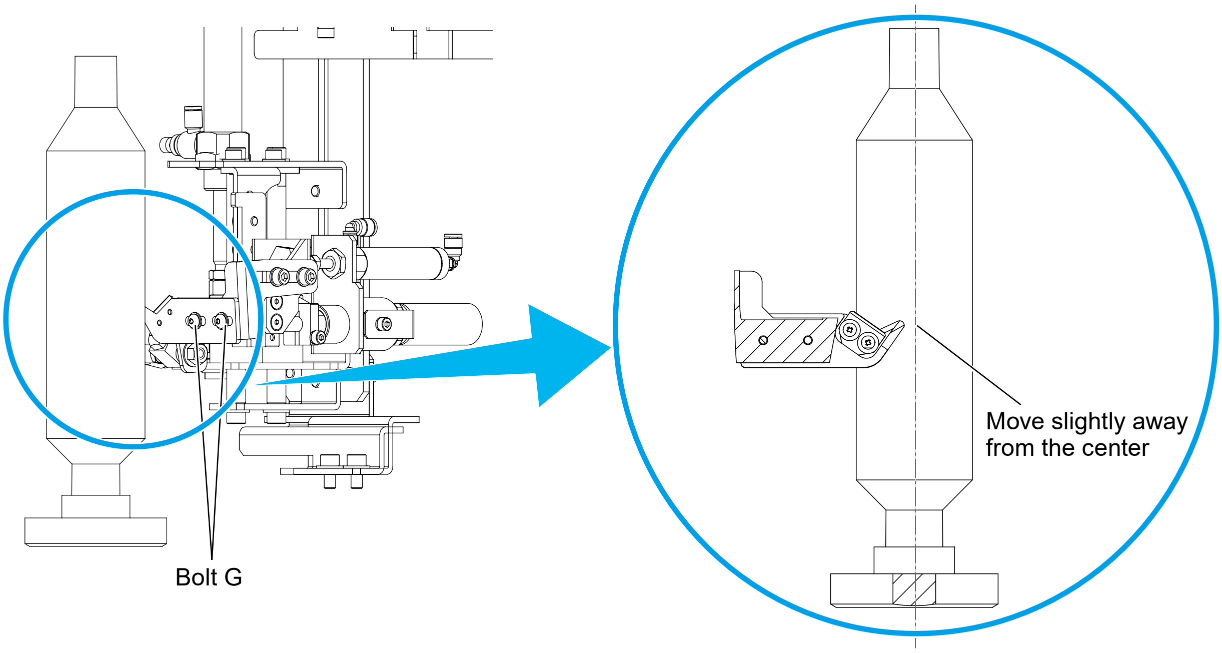


1-4 Searcher Plate Adjustment

1. **Move the searcher blade edge slightly away from the bobbin center. Loosen the bolt G and adjust it.**

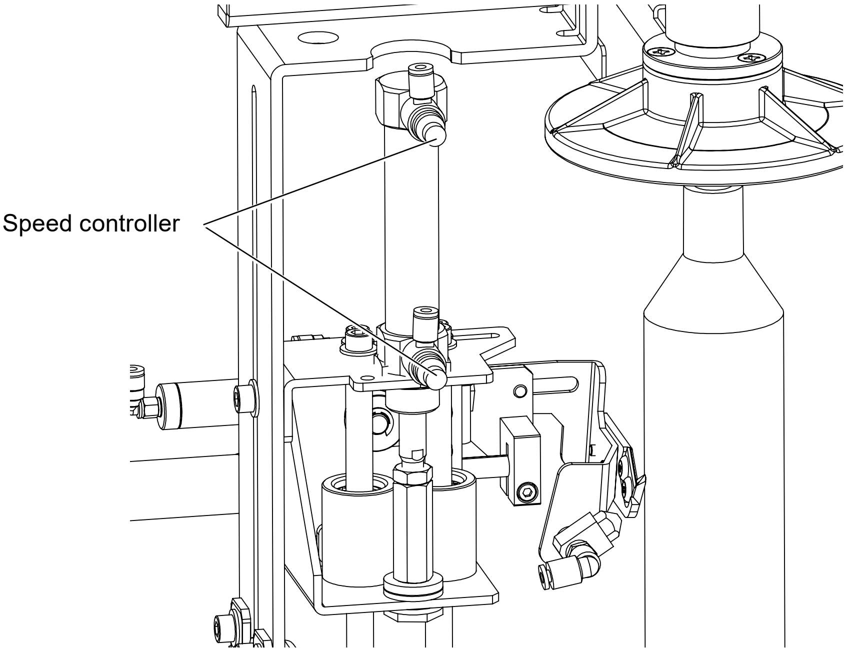
CAUTION

Do not move the search blade edge too far from the bobbin center. Doing so may result in the blade edge cutting the yarn layer or piercing the bobbin during operation.


Bolt G
Move slightly away from the center

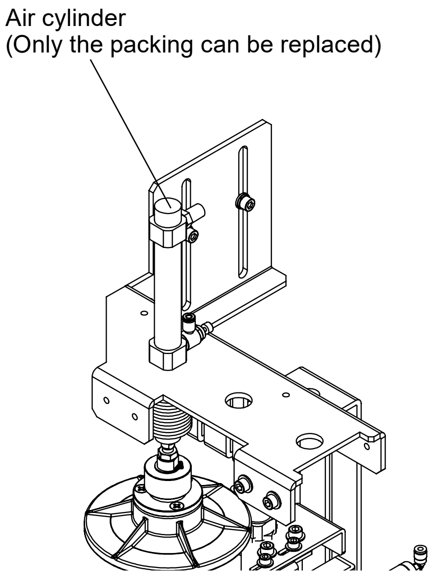
1-5 Searcher Operation Speed

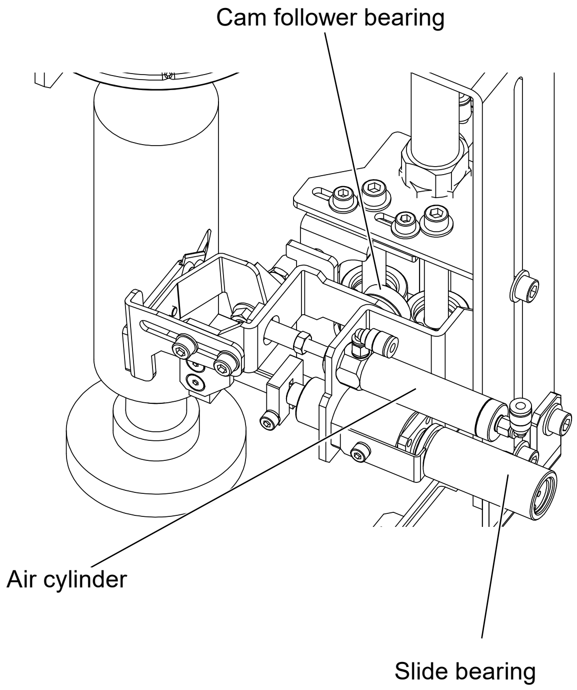
1. **The searcher vertical movement speed is adjusted using the speed controller. Adjust so that it moves slowly when lowering and quickly when rising.**


Speed controller

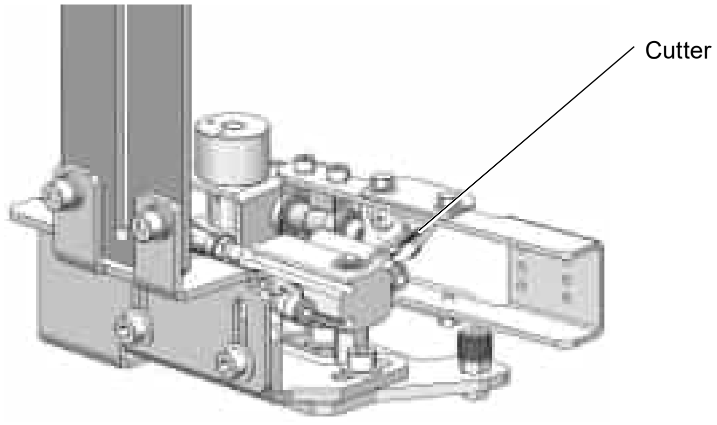
Sec 2 Consumables

If the parts are worn causing a failure or problem, replace the worn part or parts with a new one.


Air cylinder
(Only the packing can be replaced)


Cam follower bearing
Air cylinder
Slide bearing

[Bottom searcher specification]

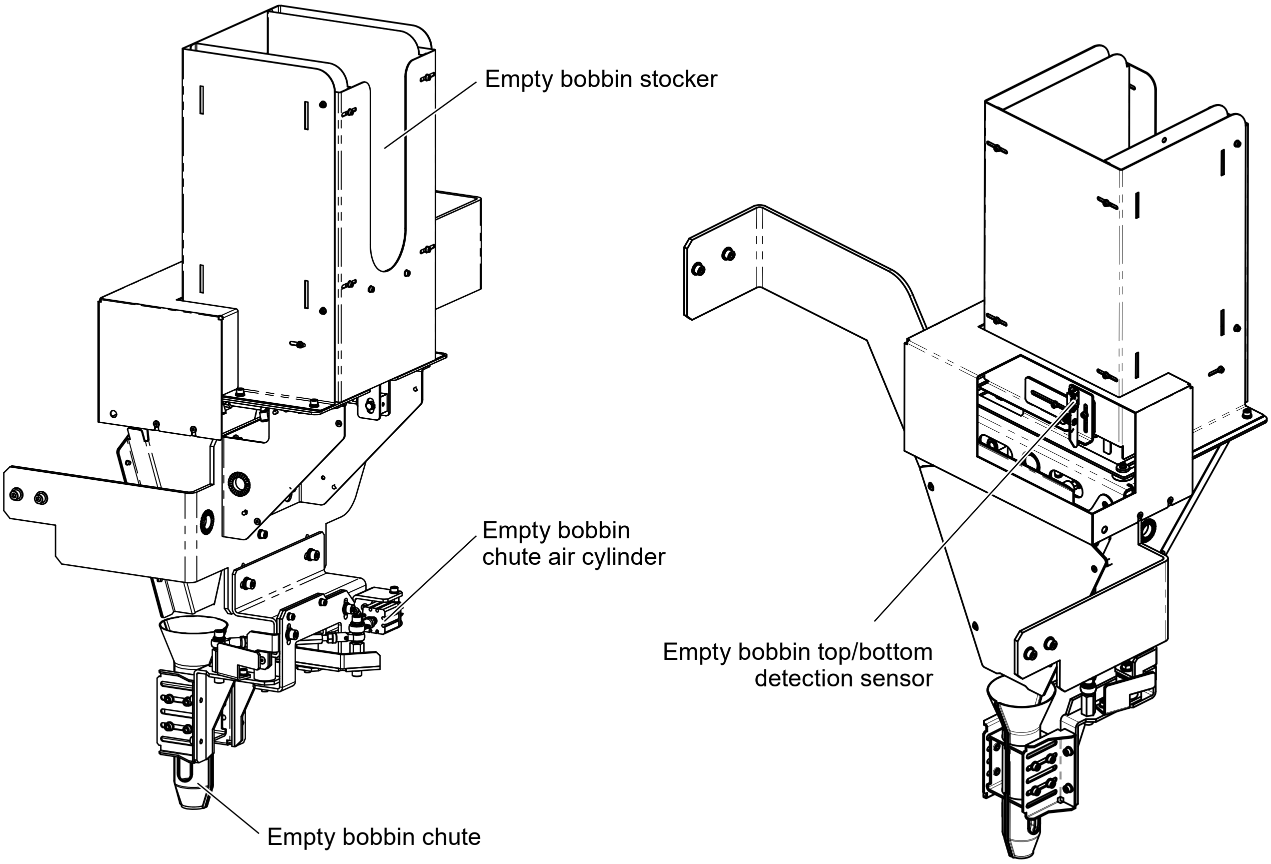


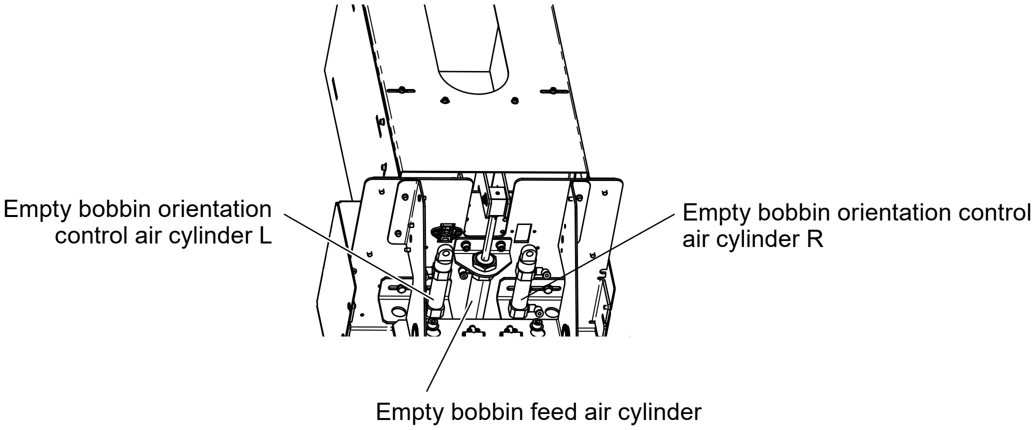
Chapter 8X Empty Bobbin Supply Device

Sec 1 External view & names of each part

The empty bobbin supply device is a device which supplies empty bobbins to empty trays.

1-1 Empty bobbin supply device overview diagram

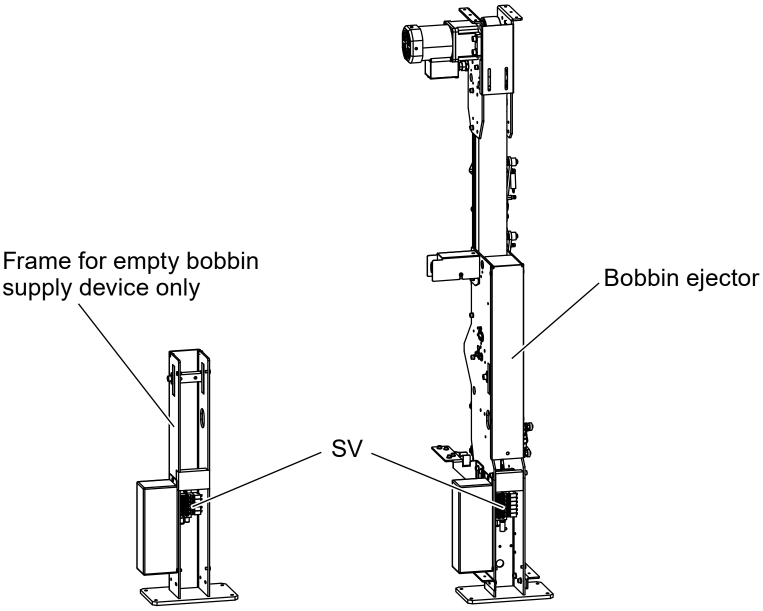

Empty bobbin stocker
Empty bobbin chute air cylinder
Empty bobbin top/bottom detection sensor
Empty bobbin chute


Empty bobbin orientation control air cylinder L
Empty bobbin orientation control air cylinder R
Empty bobbin feed air cylinder

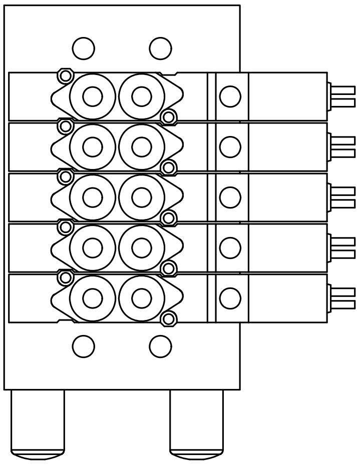
1
Sec

1-2 Solenoid valve (SV) layouts

* Solenoid valves will differ depending on specifications.

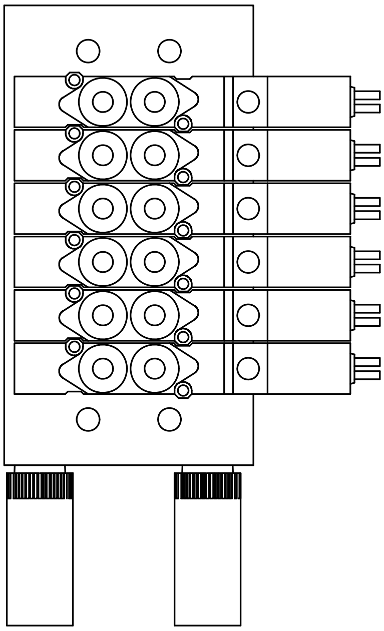

Frame for empty bobbin supply device only
Bobbin ejector
SV

[Empty bobbin supply device specification]



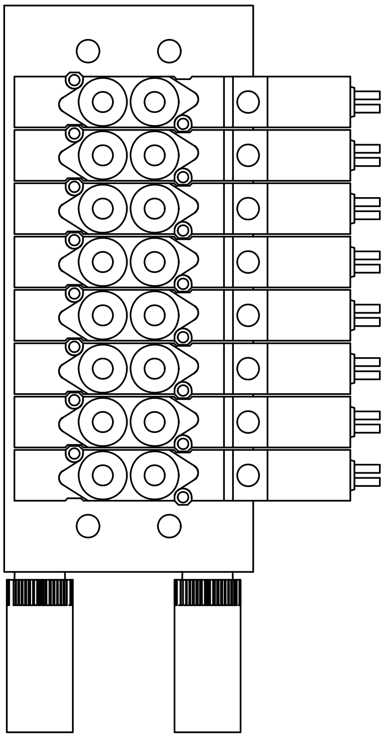
Tray separator
Empty bobbin feed
Empty bobbin orientation control
Remaining yarn brush blast
Empty bobbin chute open/close

[Bobbin ejector + empty bobbin supply device specification]



Tray separator
Bobbin ejection clamp
Empty bobbin feed
Empty bobbin orientation control
Remaining yarn brush blast
Empty bobbin chute open/close

[Empty bobbin supply device + bobbin ejector + spin inspector specification]

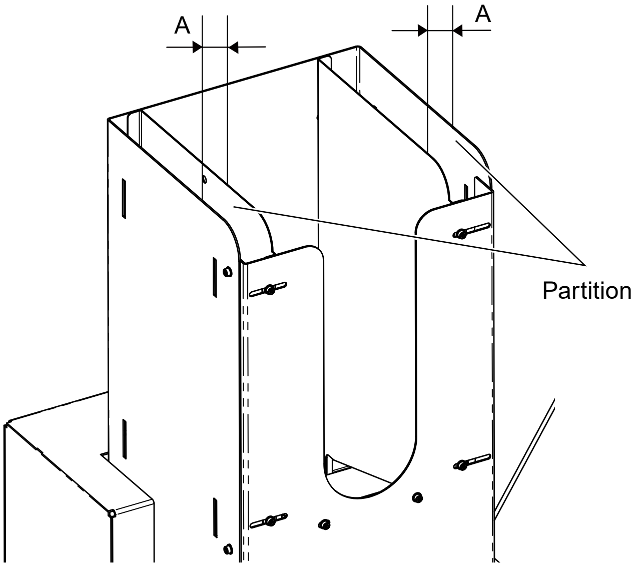


Tray separator
Bobbin ejection clamp
Empty bobbin feed
Empty bobbin orientation control
Remaining yarn brush blast
— — — — — — — — —
Empty bobbin chute open/close
Discharged bobbin separation

Sec 2 Adjustment standard

2-1 Empty bobbin stocker bobbin width

The partition positions can be adjusted to suit the empty bobbin length for bobbins of 210 mm or shorter length.
(Partitions are not included for bobbins of over 210 mm in length.)


A
A
Partition

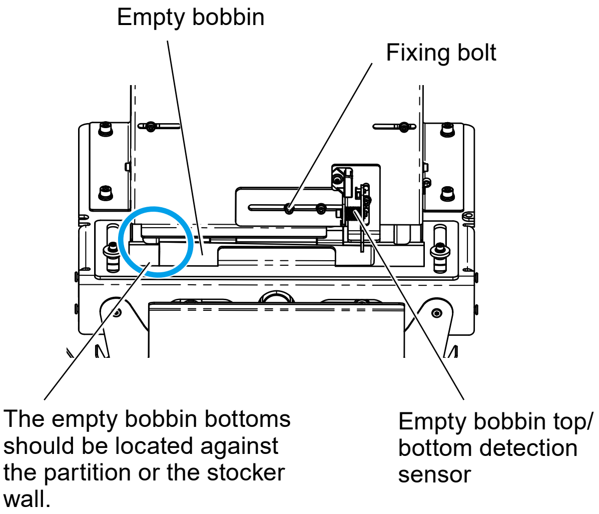
Bobbin length (mm)	Dimension A (mm)
170 to 180	35
181 to 190	30
191 to 200	25
201 to 210	20

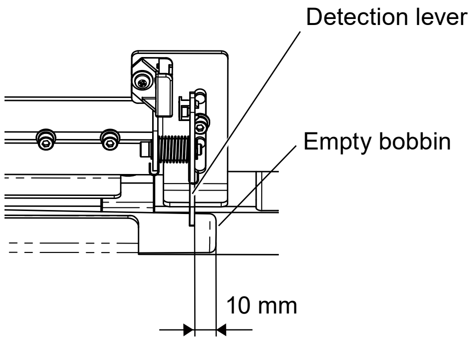
2-2 Empty bobbin top/bottom detection sensor

Left/right position

1. **The left and right positions of the detection lever and empty bobbins can be adjusted as shown in the figure below.**

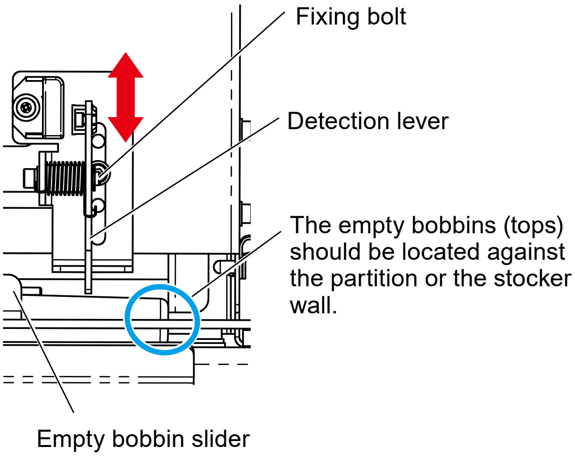
CAUTION Always stop the CBF and stop the air supply to the CBF before adjusting.


Empty bobbin
Fixing bolt
The empty bobbin bottoms should be located against the partition or the stocker wall.
Empty bobbin top/ bottom detection sensor

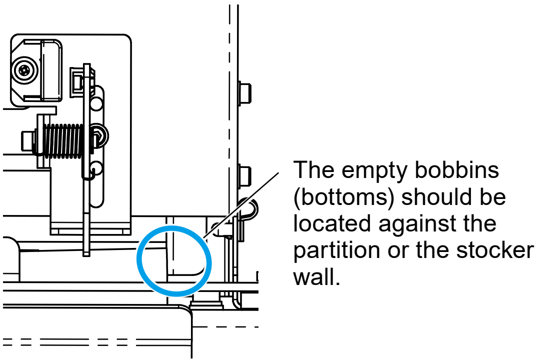

Detection lever
Empty bobbin
10 mm

Vertical position

1. **Adjust the clearance between the empty bobbin (top) and detection lever to approximately 1 mm.**

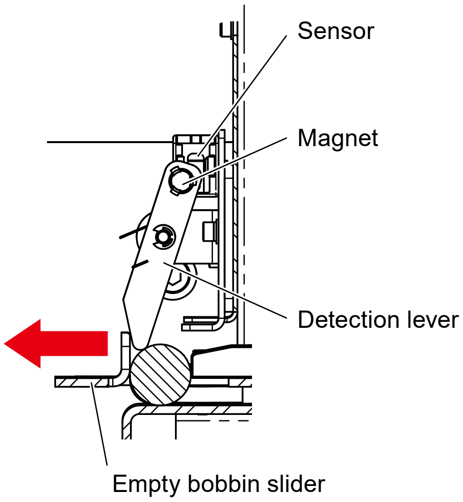

Fixing bolt
Detection lever
The empty bobbins (tops) should be located against the partition or the stocker wall.
Empty bobbin slider

2. **Check that the empty bobbin (bottom) and detection lever are touching.**

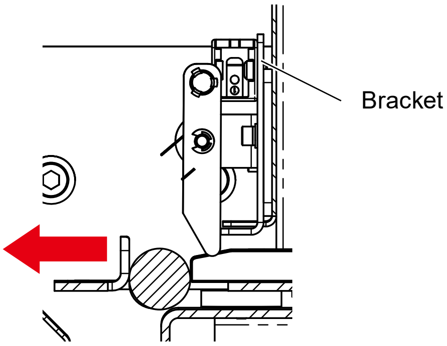

The empty bobbins (bottoms) should be located against the partition or the stocker wall.

3. **Check that the sensor detects when the empty bobbin slider is moved in the direction of the arrow.**

   * This can be checked on the I/O LED on the bobbin ejector or the frame.


Sensor
Magnet
Detection lever
Empty bobbin slider

4. **Check that the bobbin can be moved without the detection lever contacting the bracket when the empty bobbin slider is moved further in the direction of the arrow.**

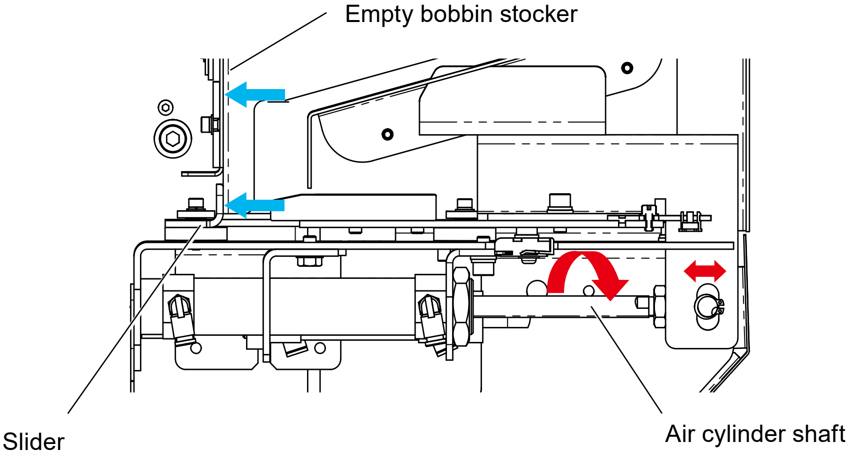


2-3 Empty bobbin slider position

Rotate the air cylinder shaft to adjust so that the empty bobbin stocker internal wall surface and slider section surface indicated by the blue arrows are aligned.

CAUTION

Always stop the CBF before carrying out adjustment.


Empty bobbin stocker
Slider
Air cylinder shaft

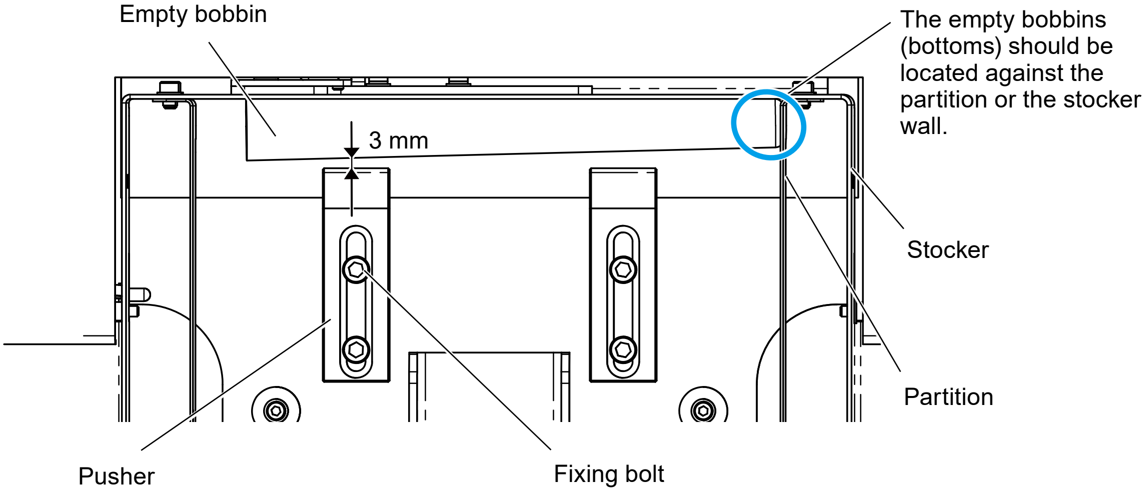
2-4 Pusher position

Adjust the left and right pusher position so that the clearance with the empty bobbin is 3 mm as shown in the figure below.

* Adjustment of the pusher position is left and right symmetrical. The figure below shows the left side pusher adjustment position.

CAUTION

Always stop the CBF before carrying out adjustment.

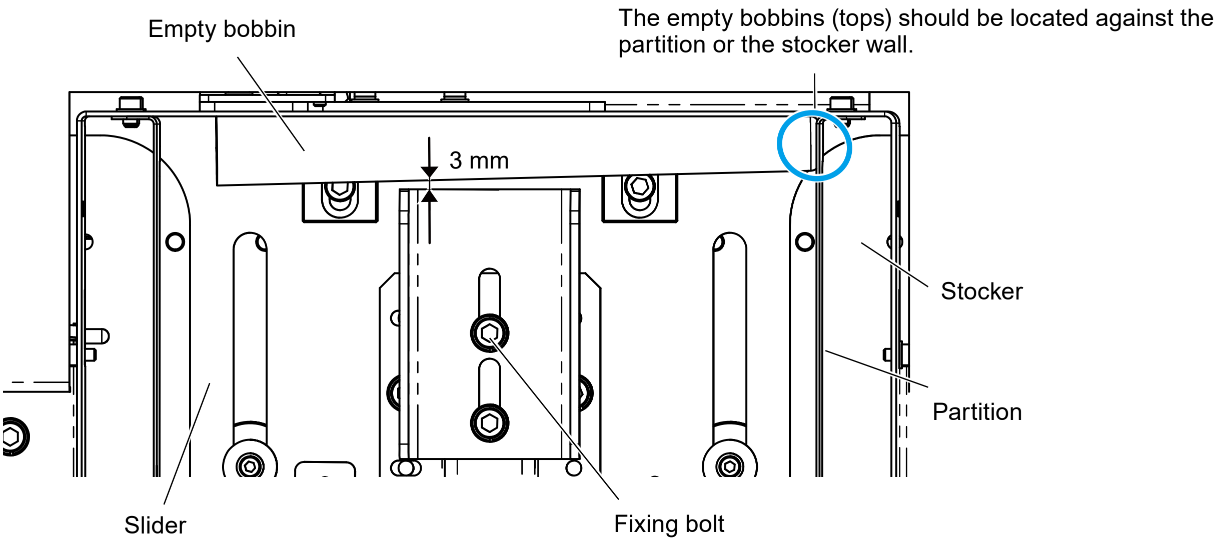

Empty bobbin
3 mm
The empty bobbins (bottoms) should be located against the partition or the stocker wall.
Stocker
Partition
Pusher
Fixing bolt

2-5 Empty bobbin change guide position

Adjust the position of the bobbin change guide so that the clearance with the empty bobbin is 3 mm when the slider is moved all the way in the direction of the red arrow.

CAUTION

Always stop the CBF and stop the air supply to the CBF before adjusting.

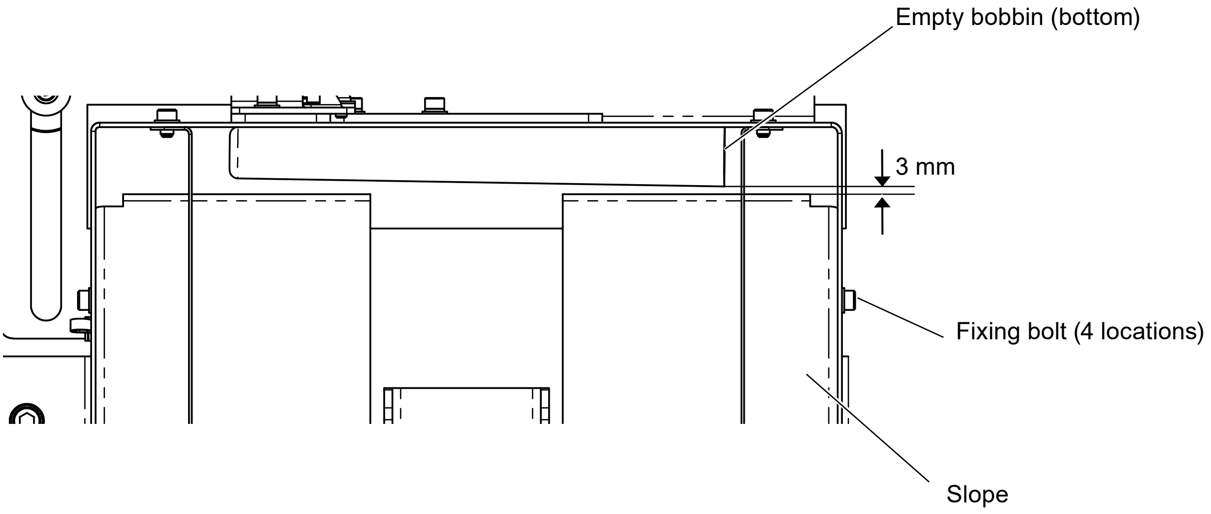

Empty bobbin
The empty bobbins (tops) should be located against the partition or the stocker wall.
3 mm
Stocker
Partition
Slider
Fixing bolt

2-6 Slope position

Adjust the slope position so the clearance with the empty bobbin (bottom) is 3 mm.

CAUTION

Always stop the CBF before carrying out adjustment.

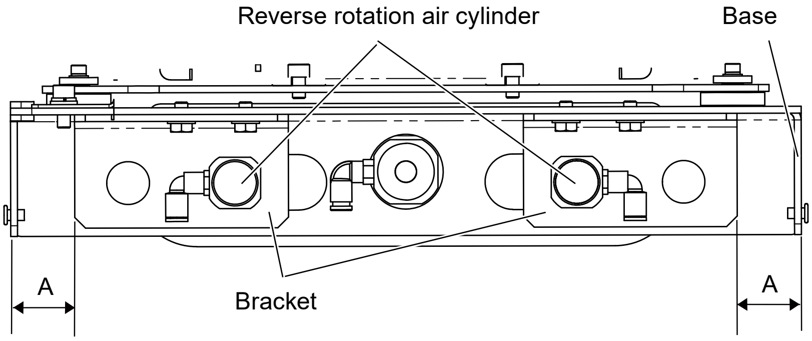

Empty bobbin (bottom)
3 mm
Fixing bolt (4 locations)
Slope

2-7 Empty bobbin reverse rotation air cylinder position

Adjust the reverse rotation air cylinder bracket left and right ends and base to match the bobbin length.

CAUTION

Always stop the CBF before carrying out adjustment.



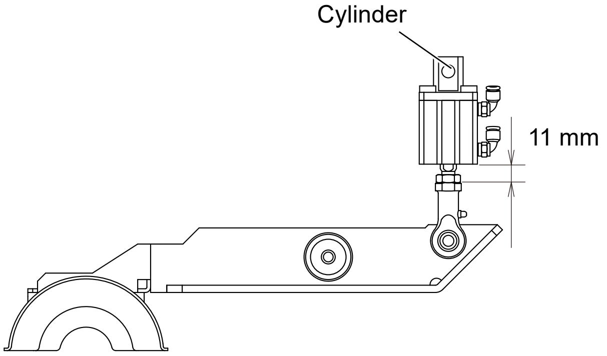
Reverse rotation air cylinder
Base
A
Bracket
A

Bobbin length (mm)	Dimension A (mm)
170 to 190	60
191 to 210	50
211 to 230	30
231 to 260	20

2-8 Chute position

Chute guide drive cylinder

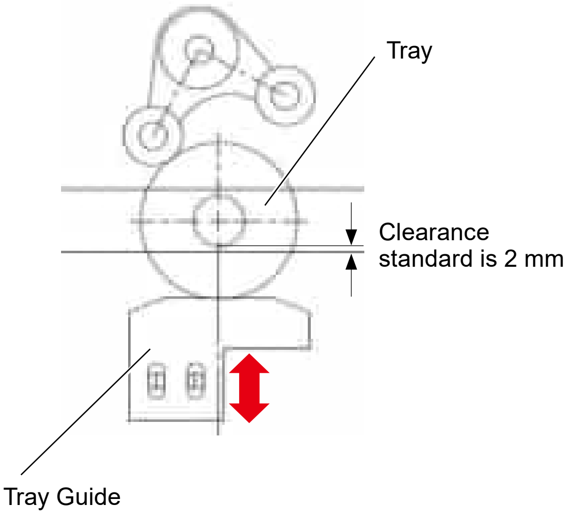
The standard dimension from the rod end to the cylinder while the cylinder is retracted (the chute guide closed) is 11 mm.



Cylinder
11 mm

Tray guide

Adjust the tray guides so that the tray is centered on the guides.

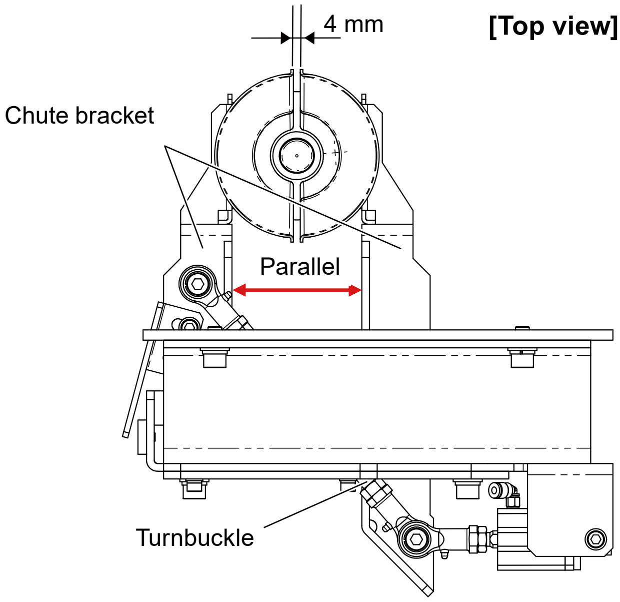


Tray
Clearance standard is 2 mm
Tray Guide

Chute center

1. **Adjust with the turnbuckle so that the chute levers are parallel to each other.**

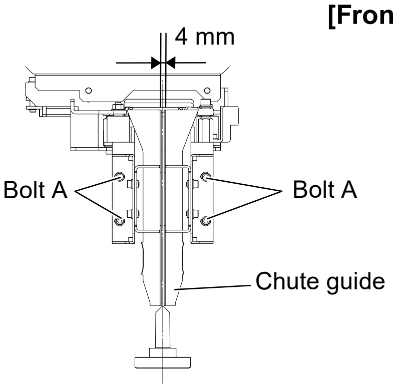
[Top view]


4 mm
Chute bracket
Parallel
Turnbuckle

2 **Loosen the chute bracket bolts A to adjust so that the chute guide gap is 4 mm.**

* The standard gap when the chute guide is closed is 4 mm.

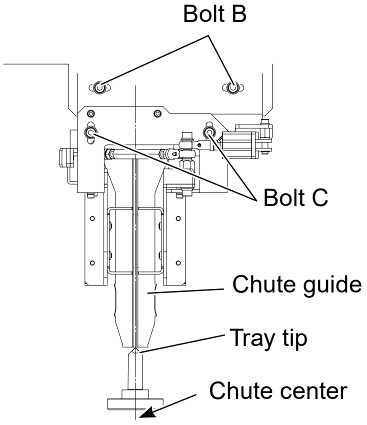
[Front view]


4 mm
Bolt A
Bolt A
Chute guide

3. **Align the chute center laterally.**
   Loosen the bolts B to move the chute bracket front-to-back.

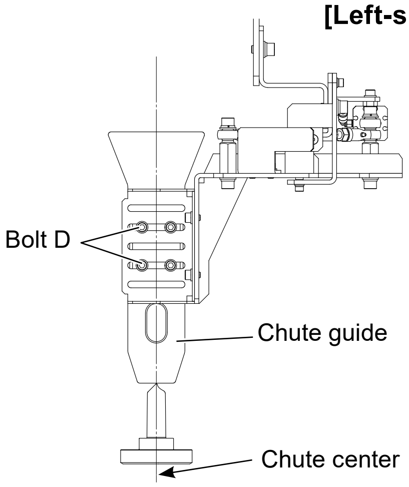
4. **Align the chute guide bottom end with the tray tip.**
   Loosen bolts C to allow the chute to be moved up and down.

[Rear View]


Bolt B
Bolt C
Chute guide
Tray tip
Chute center

5. **Align the chute center longitudinally.**
   Loosen bolts D to allow the chute to be moved forward and back.

[Left-side view]


Bolt D
Chute guide
Chute center

Sec 3 Maintenance

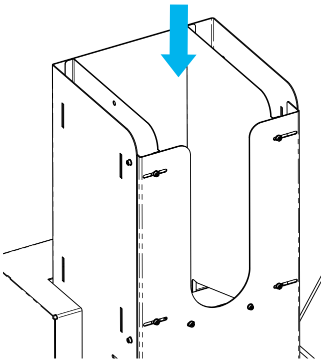
3-1 Cleaning of the empty bobbin stocker and surrounding area

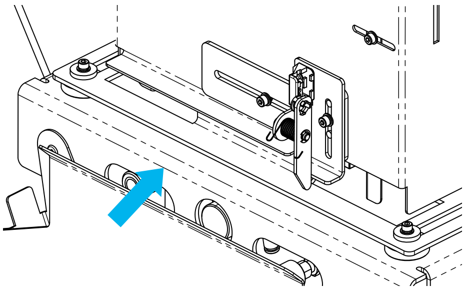
Remove any yarn waste and fiber waste that has built up inside the empty bobbin stocker and around the bobbin top/bottom detection sensor and other areas.

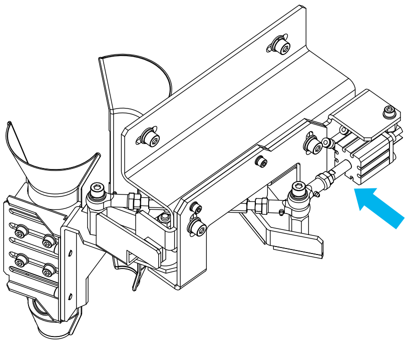
(Approximately: 1 time per 3 to 6 months)

CAUTION

Always stop the CBF and remove all empty bobbins before carrying out work.







3-2 Inspection & lubrication

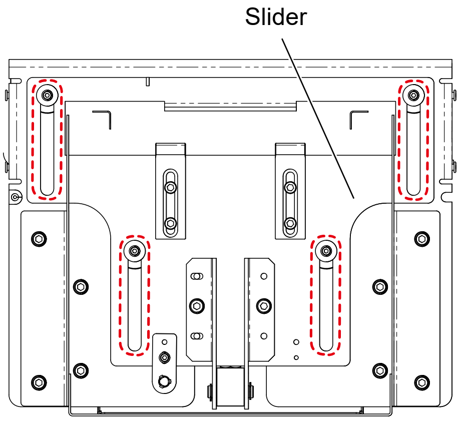
After wiping the areas marked with the red dotted lines, apply grease (approximately 1 g per location).

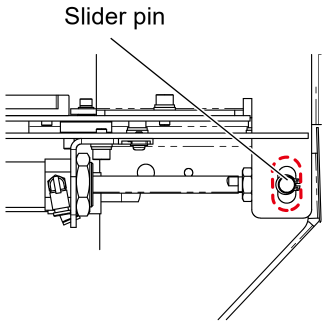
* Also clean the front and back of the slider pin in the same manner.

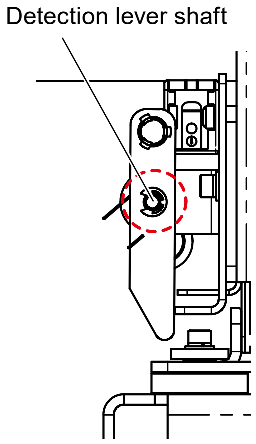
CAUTION

Always stop the CBF and stop the air supply to the CBF before adjusting.

Frequency	Item	Guideline
Yearly	Slider	Clean and lubricate the area around the spacers which support the slider * Multemp No.2
	Slider pin	Lubricate the shaft which connects the slider and air cylinder * Multemp No.2
	Detection lever shaft	Lubricate the detection lever shaft * Multemp No.2

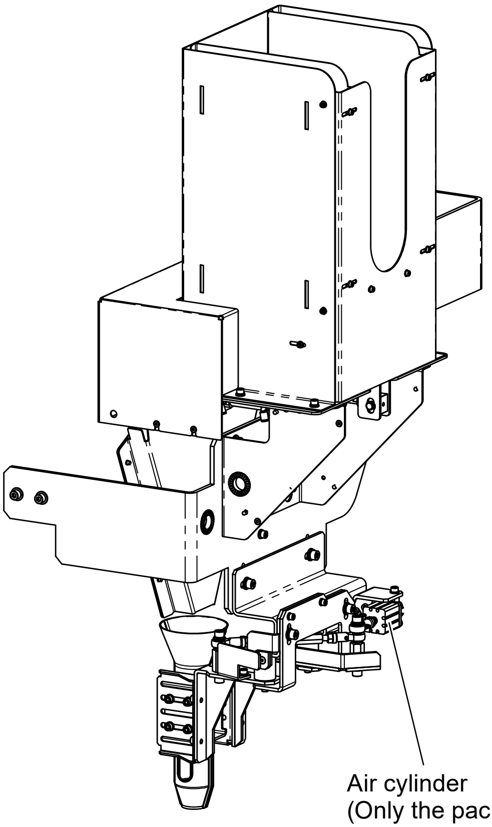




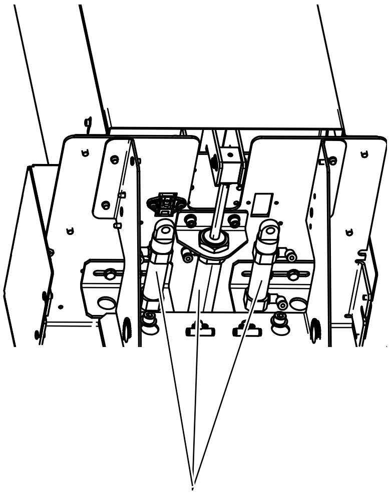


Sec 4 Consumables

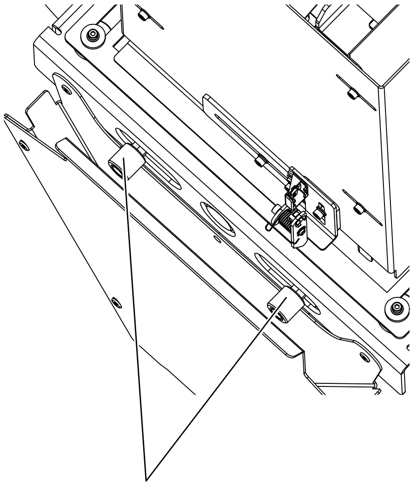
If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.



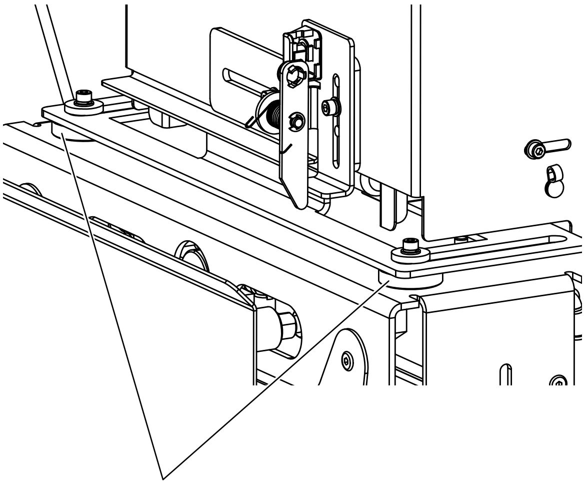
Air cylinder
(Only the packing can be replaced)



Air cylinder
(Only the packing can be replaced)



Rubber covers



Spacers (4 locations)

AD

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- 1-2 Stoppage
- 1-3 Doffing Operation
- 1-4 Returning to the Home Position

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- 2-2 Index Block
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- 2-5 Take-up Tube Control Guide Position
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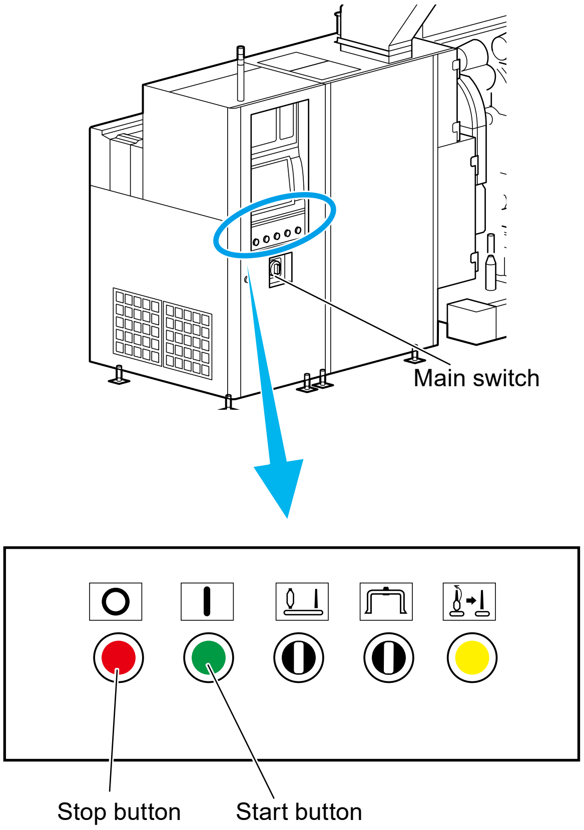
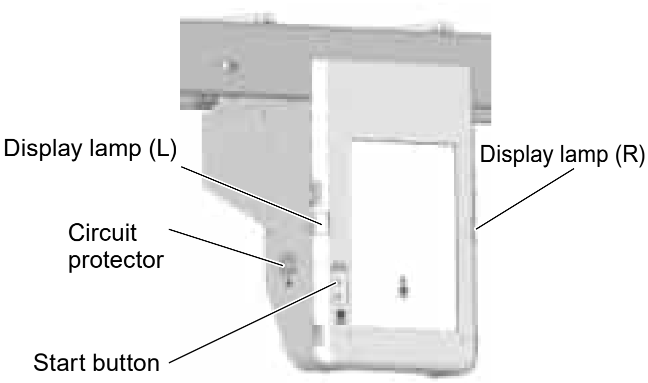
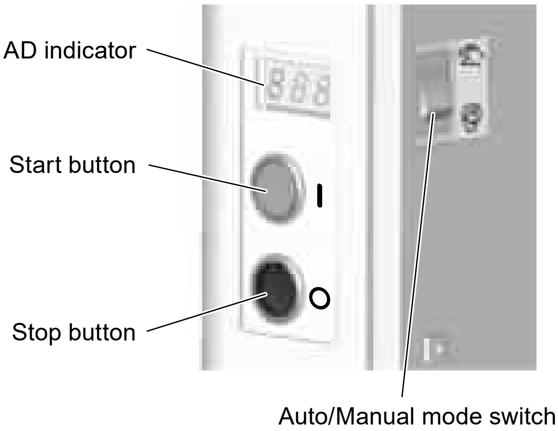
9
Chapter

muratec

Sec 1 Operation Method

Winder	AD
 Main switch Stop button Start button	 Display lamp (L) Display lamp (R) Circuit protector Start button **[AD operation panel]**  AD indicator Start button Stop button Auto/Manual mode switch

1-1 Startup (Normal operation)

1. **Press the main switch.**
2. **Raise the circuit protector operation lever located on the left side of the AD.**
   The AD power supply is turned ON and the AD can be started up. (The AD start button lights up)
3. **Press the winder start button.**
   The green display lamps on both sides of the AD light up, and the AD begins operation.
4. **If the AD automatic start mode is turned OFF, press the AD start button.**

1-2 Stoppage

Stopping the Winder & AD Simultaneously

1. **Press the winder stop button.**
   The blower, conveyor, blow cleaner and winding units all stop automatically in sequential order, and the AD automatically stops its travelling operation.
2. **Turn OFF the main switch.**

CAUTION

As it takes some time to completely stop the AD operation, wait for at least 10 seconds after pushing the winder stop button before turning OFF the main switch.

Stopping the AD (Bringing only the AD to a temporary stop)

1. **Press the stop button on the AD operation panel.**

* To resume AD operation, press the AD start button.

Emergency Stop

1. **If it is necessary to stop the winder immediately to avoid injury or further machine damage, turn the main switch OFF immediately.**
   The whole machine and its devices will come to a complete stop.

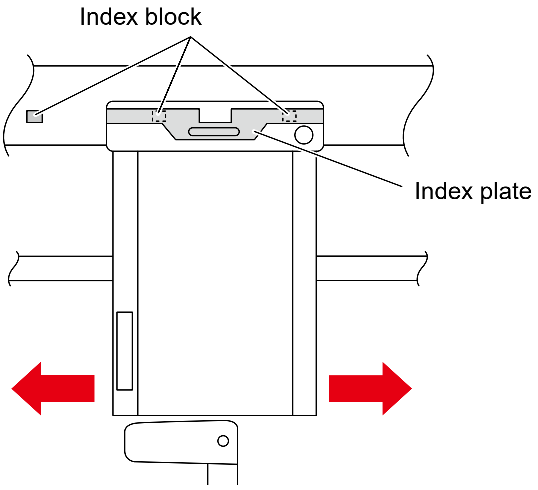
* To resume operation after the emergency stop, turn ON the main switch.

CAUTION

Bringing the machine to a stop in the middle of an operation will cause the machine to overload. Do not use the emergency stop switch unnecessarily, or unless it is an emergency.

1-3 Doffing Operation

Manual Operation Mode



1. **Press the AD stop button to stop the AD automatic operation.**
2. **Set the auto/manual mode switch to manual.**
   The index plate cylinder will be activated.
3. **Move the AD with your hands to engage the index plate on the index block.**
4. **Ensure that the index plate has been correctly engaged on the index block, return the auto/manual mode switch to auto and then reset it to manual.**
   The index plate will engage on the index block.
5. **Press the AD start button to operate in manual mode.**

* Press the start button within 3 seconds (green lamps on both sides will flash) after switching to manual mode. The AD will not operate if there is a delay of more than 3 seconds. Return the mode switch to auto, and start over from step 4.

* The AD performs doffing while the start button is depressed. The AD will stay in the same state after you release the button. If the AD cam shaft rotates 360°, the index plate will automatically disengage to end the operation cycle.

* If you wish to operate the doffer in manual mode again after the cycle has ended, return the mode switch to auto and then start over from step 2.

Automatic Operation Mode

1. **Ensure that the auto/manual mode switch is set to auto, and press the AD start button to engage the AD travelling operation.**
2. **When a winding unit outputs a full package signal, the AD will start to travel toward that unit.**
3. **When the AD approaches the winding unit with the display lamp lit up (indicating a full package), the AD will automatically slow down and the index plate cylinder will be activated.**
4. **The AD stops traveling when the index plate is engaged on the index block.**
5. **The AD automatically performs a series of doffing operations.**
6. **After the series of doffing operations have been completed, the index plate is disengaged from the index block and the AD resumes traveling.**

* Specify the control settings on VOS ahead of time that best suit the machine's specification, the operation conditions and the method of use.

1-4 Returning to the Home Position

Return the device to the home position using the procedure below, if, during the auto mode operation, there is a stoppage in the middle of a cycle, due to a doffing error, for example.

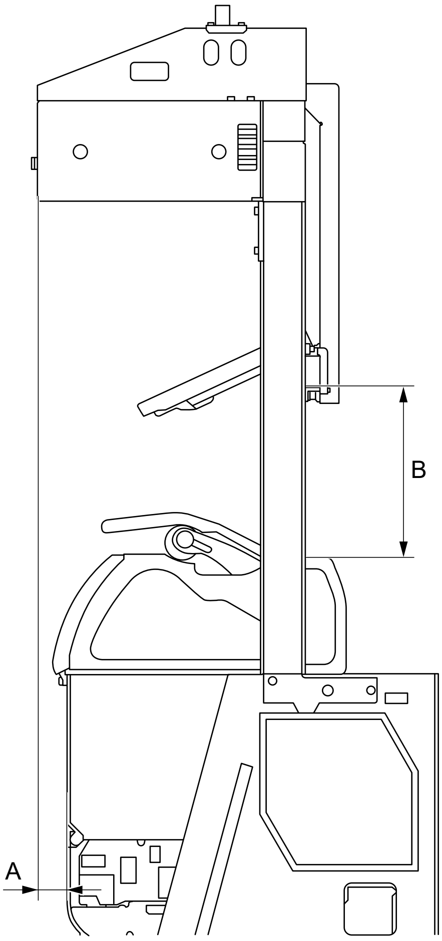
1. **Remove any obstructions that prevent the device from returning to the home position, such as the take-up tube or a package.**
2. **Press the AD start button while it is flashing.**
   Press the start button once for the AD to return to the home position.
   "HP" is displayed on the AD indicator while the device is returning to the home position.
   Once it returns to the home position, the index is disengaged and the "HP" display disappears. The start button also flashes at the same time, and the startup operation is now possible.
3. **Press the AD start button to resume operation.**
   The green display lamp lights up, the start button lamp turns off, and the automatic operation resumes.

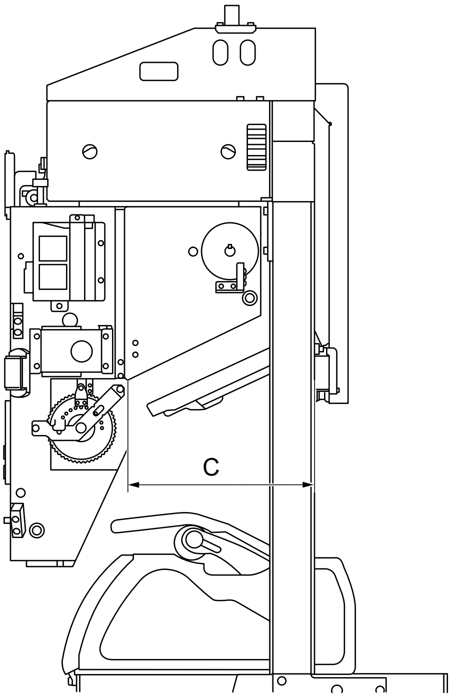
Sec 2 Part Adjustment

CAUTION Be sure to always stop the machine operation before performing an adjustment.

2-1 Rail & Stocker Bar

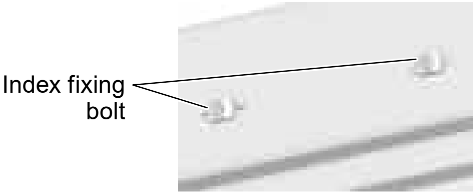
Item	Adjustment Standard	Adjustment Location
Front dimensions of rail	A = 58 mm ± 0.5 mm Remove front cover on unit to check	Both ends on each section
Stocker bar height	B = 345.5 mm ± 0.5 mm Check distance between top of unit case and bottom of stocker bar	Center of each section
Front and back of stocker bar	C = 381 mm ± 0.5 mm Remove the AD cover and check the distance between the AD and the stocker bar	Center of each section





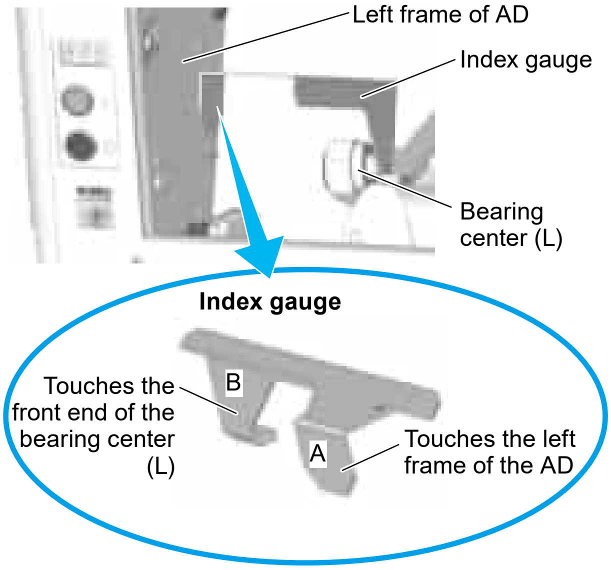
2-2 Index Block

1. **Loosen the fixing bolts on the index block.**

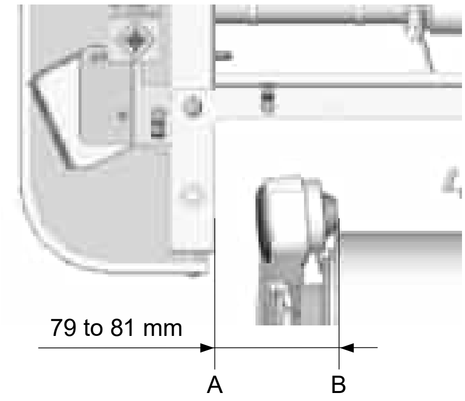

Index fixing bolt

2. **Set the auto/manual mode switch to manual, and engage the index plate on the index block.**

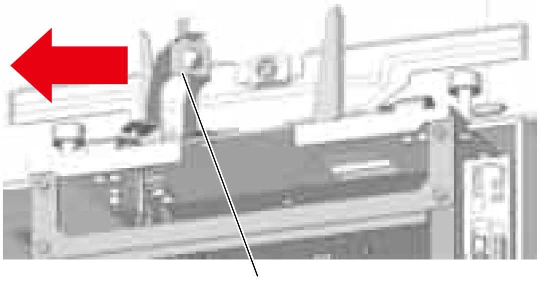
3. **Using the index gauge, adjust the AD unit by moving it to the right and left by hand, so that the horizontal distance between the left frame of the AD and the front end of the bearing center (L) is between “79 and 81 mm.”**


Left frame of AD
Index gauge
Bearing center (L)
Index gauge
Touches the front end of the bearing center (L)
B
A
Touches the left frame of the AD

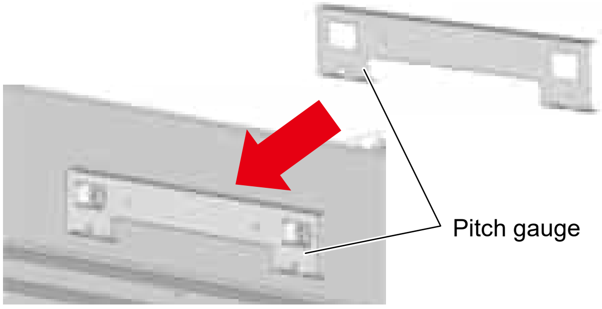
* The index gauge width is 80 mm (between A and B as shown in the diagram on the right). Using the gauge as shown in the diagram, adjust the distance between the front end of the bearing center (L) and the left frame of the AD to secure the appropriate horizontal distance.
When the gauge touches the left frame of the AD, ensure that the gauge stays straight.


79 to 81 mm
A
B

4. **Maintain the AD position as per step 3, and fix the index block.**
Using the diagram on the right as a reference for this procedure, if you remove the front cover of the AD and twist the bracket for the index count sensor, you can fix the index block while the index plate is engaged.


Bracket for the index count sensor

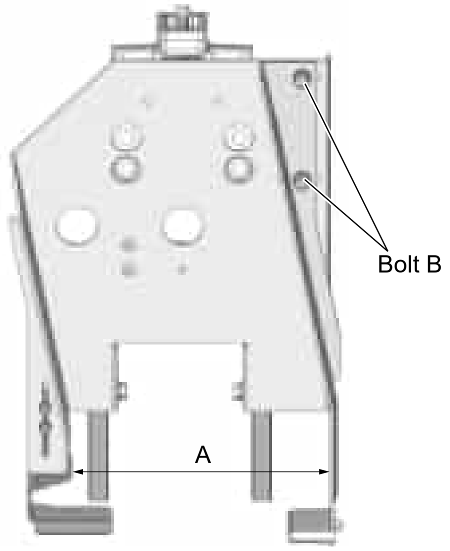
5. **When the yarn type used in this section is the same (when the take-up tube and winding position is the same), use the index block fixed in step 4 as the standard. Maintain the dimensions within the index block as per the pitch gauge and fix the block.**


Pitch gauge

2-3 Stocker

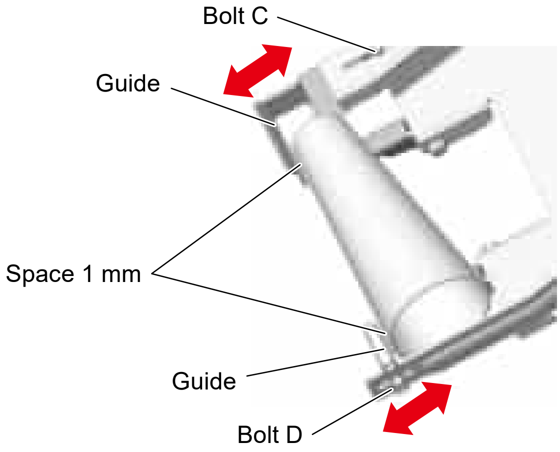
Guide Width on Right Side

A = Take-up tube length + (8 to 10 mm)
Loosen bolt B and fix the width after adjusting “A” as shown in the diagram.



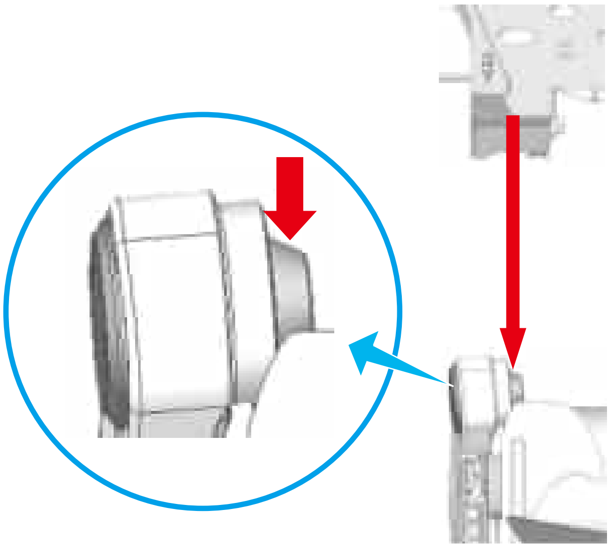
Forward/Backward Direction

Adjust the forward or backward direction of the guide using bolts C and D, so that when the chuck on the AD side is holding the take-up tube on the stocker, the space between the right and left guides and the take-up tube is 1 mm.

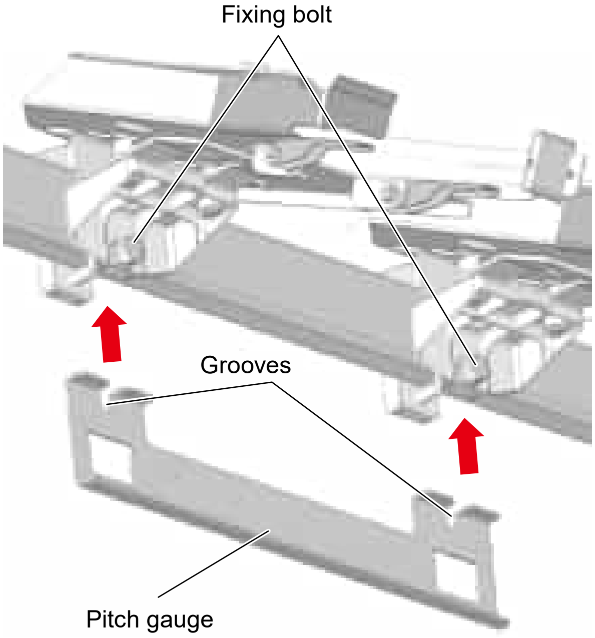


Left/Right Position

Suspend a plump-bob from the inner left side of the stocker, using the middle of the tilted side on the bearing center’s (L) tapered section as a guide, and fix the stocker.



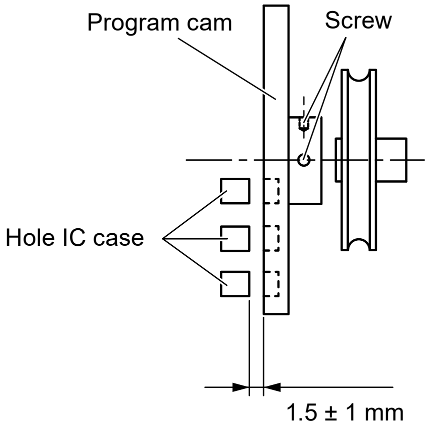
* As with the index block, if the same yarn type is used within the section (when the take-up tube and winding positions are the same), use the fixed stocker mentioned above as a reference standard. Then, maintain the same distance between each stocker using the pitch gauge and fix them. Turn the index pitch gauge around to use. Set the grooves located on the each end of the pitch gauge so that they fit onto the fixing bolts for the stocker, maintaining the same distance between the stockers, and fix the bolts.



2-4 Sensor

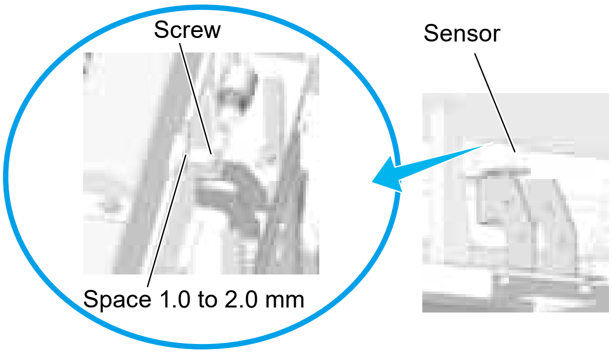
Proximity Sensor

Use the screw(s) to adjust the distance between the program cam and the case for the hole IC to 1.5 mm ± 1 mm.


Program cam
Screw
Hole IC case
1.5 ± 1 mm

Index Block Count Sensor Position

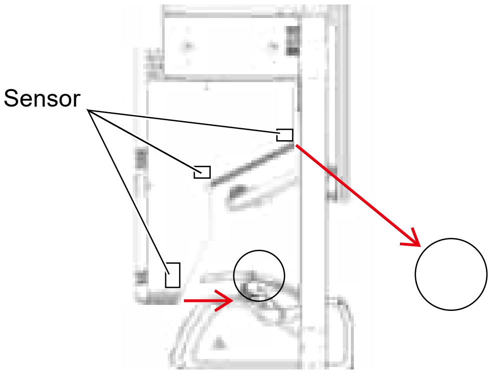
Use the screw(s) to adjust the distance between the index block and the sensor so that it is between 1.0 and 2.0 mm.


Screw
Space 1.0 to 2.0 mm
Sensor

Package Detection/Take-up Tube Detection Sensor Position

Adjust the sensors so that they detect the backward package, the package on the drum and the take-up tube on the stocker.

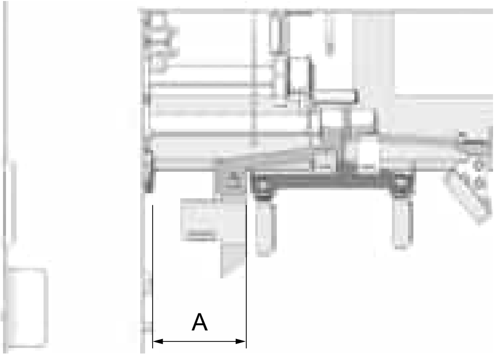
* Refer to Chapter 9, 5-2 for further details on the volume settings for the sensor, etc.



2-5 Take-up Tube Control Guide Position

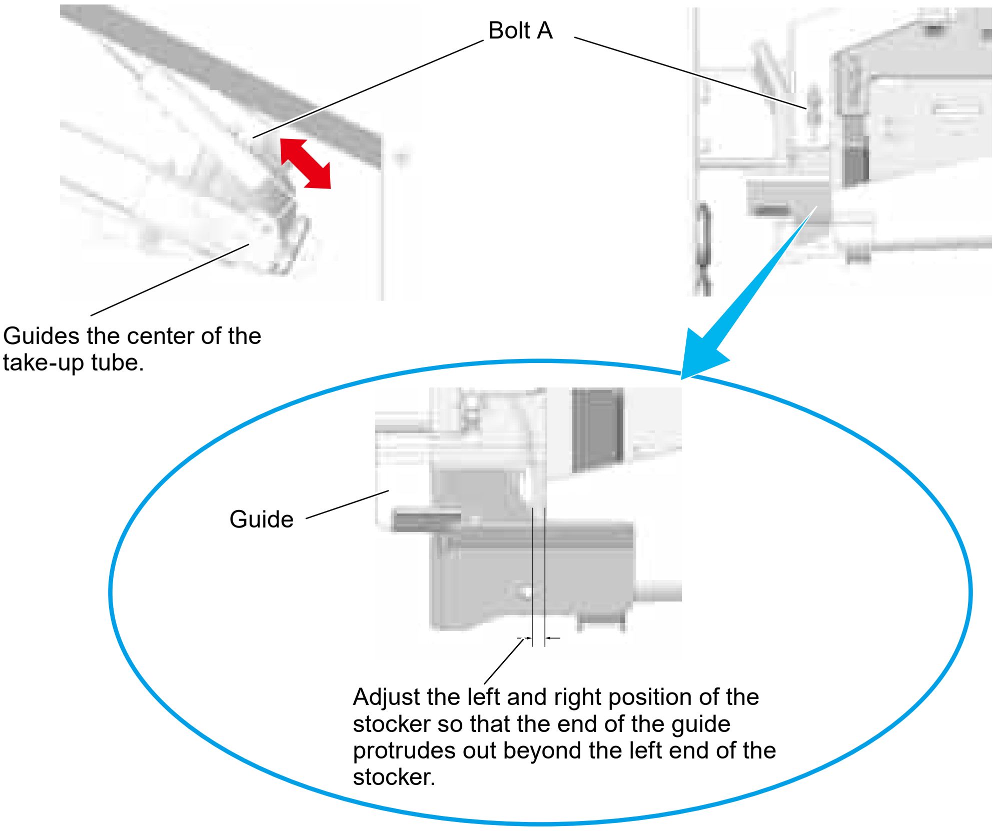
Left/Right Position for L Side Guide

A = 80 to 81 mm



Forward/Backward Position

Loosen bolt A and adjust the guide so that when the guide is lowered onto the stocker, it corresponds to the diameter of the take-up tube.

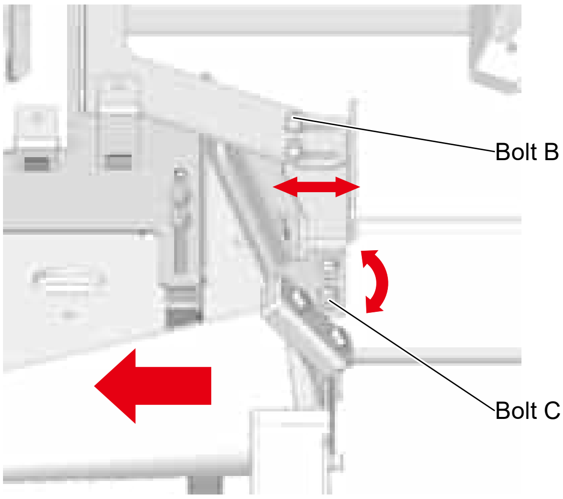


Guides the center of the take-up tube.

Adjust the left and right position of the stocker so that the end of the guide protrudes out beyond the left end of the stocker.

R Side Guide Position

When the guide lowers down onto the stocker as shown in the diagram on the right and the tilted side pushes against the take-up tube, the tube position will move closer to the left side.
Adjust the right and left position using bolt B and the angle of the tilted side using bolt C so that the tilted side of the guide touches the tube when the guide lowers down.



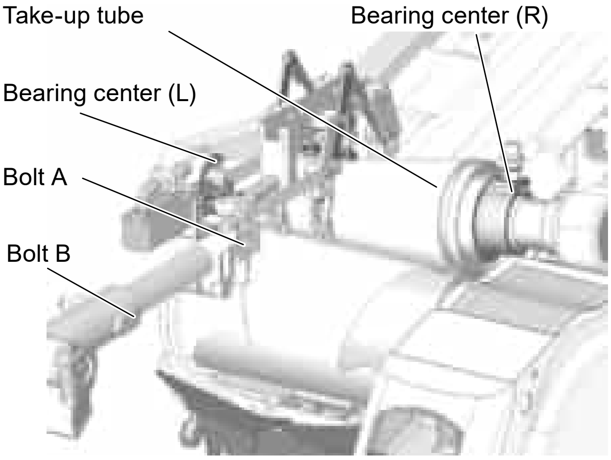
2-6 Chucker

1. **While bolts A and B are loosened, chuck the take-up tube on the drum.**

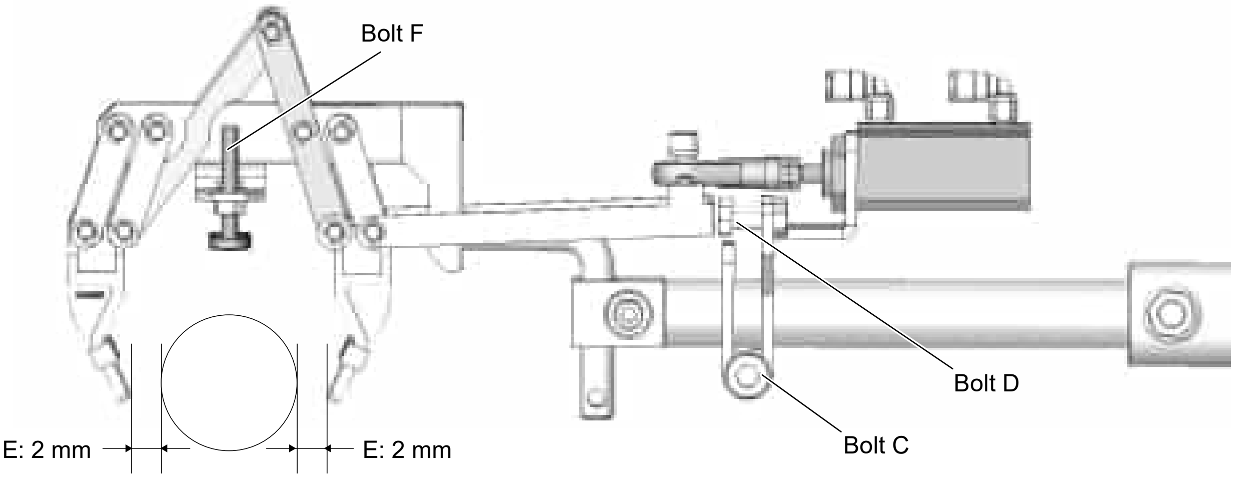
2. **Align the take-up tube center with the bearing center, and tighten bolts A and B.**

3. **While the chuck lever is opened, loosen bolt C. Move the cylinder position forward or backward so that distance E, between the take-up tube diameter and the chuck lever, is 2 mm. Then, tighten bolt C.**

4. **Use bolt D to make fine adjustments to distance E.**

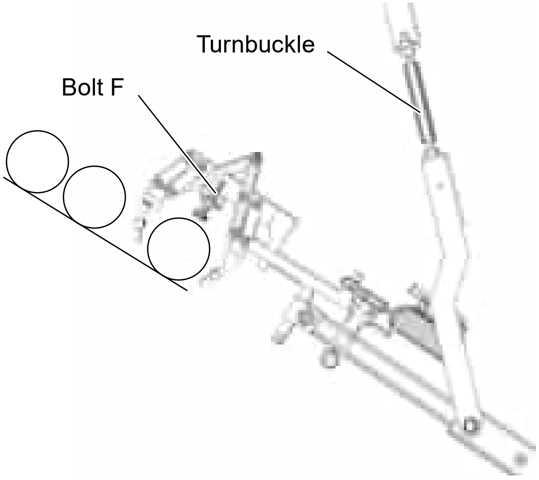

Take-up tube
Bearing center (R)
Bearing center (L)
Bolt A
Bolt B

5. **While the chucker is holding the take-up tube, lower bolt F until it touches the take-up tube, and fix it in place.**


Bolt F
Bolt D
Bolt C
E: 2 mm
E: 2 mm

6. **Use the inching operation to stop the chucker while it is holding the take-up tube on the stocker.**

7. **Adjust and fix the turnbuckle so that bolt F is at a height where it touches the take-up tube on the stocker.**


Turnbuckle
Bolt F

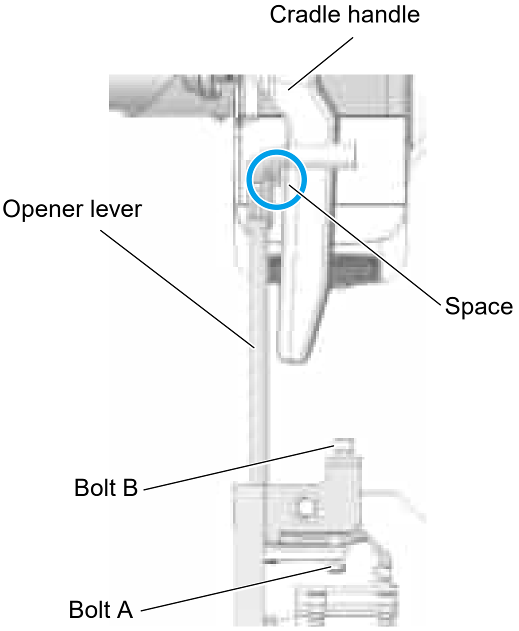
2-7 Opener Lever

Insertion Position

Use bolt A to adjust the insertion position for the opener lever. When there is no take-up tube on the cradle, lower the opener lever. Adjust it so that the space between the cradle handle and the opener lever is between 1 and 2 mm.

[Bolt A]

Tighten	The front end of the opener lever moves right
Loosen	The front end of the opener lever moves left



Opening Amount

Use bolt B to adjust the how much the opener lever opens.
Open the cradle handle on the drum. Tighten bolt B and fix it so that there is 1 mm of space beyond the position where the bearing center (R) is fully opened.

[Bolt B]

Tighten	The opening amount becomes smaller
Loosen	The opening amount becomes bigger

* Here, ensure that the take-up tube inserted by the chucker is set smoothly in between the bearing centers (L) and (R) without having any contact with either center.
The doffing operation becomes more stable as the clearance between the bearing center and the take-up tube widens.

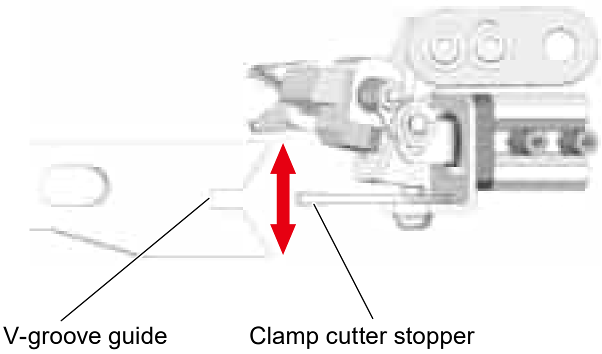
2-8 Cutter

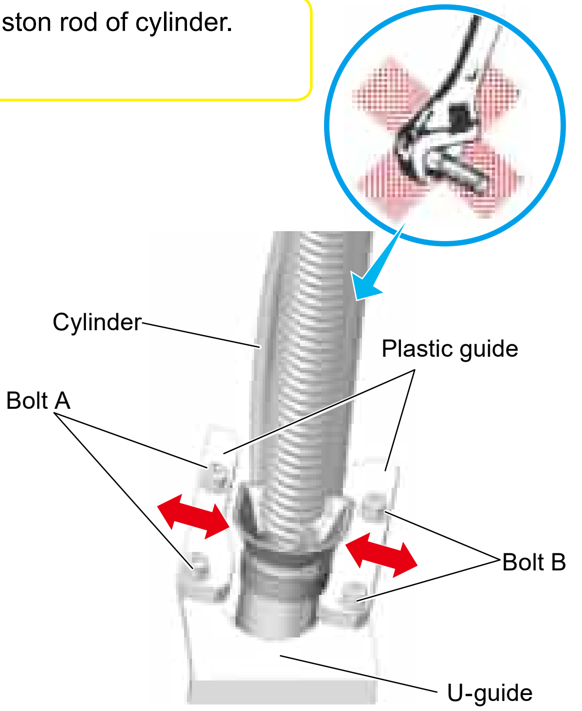
U-guide Width

Lower the clamp cutter and move it to the yarn clamp position.
During this operation, loosen bolts A and B and adjust the plastic guide width on the U-guide for the AD side.
Fix it so that the stopper for the clamp cutter does not come out from the V-groove on the unit side.

CAUTION

Avoid damage and rotational torgue to the piston rod of cylinder.

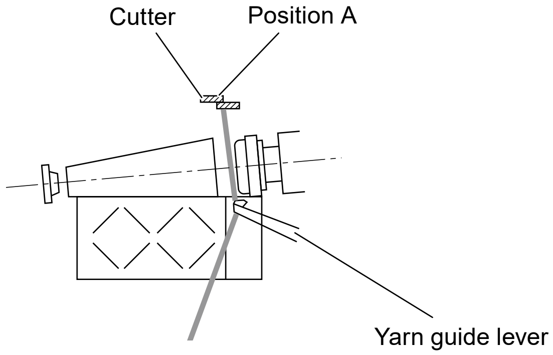

V-groove guide
Clamp cutter stopper

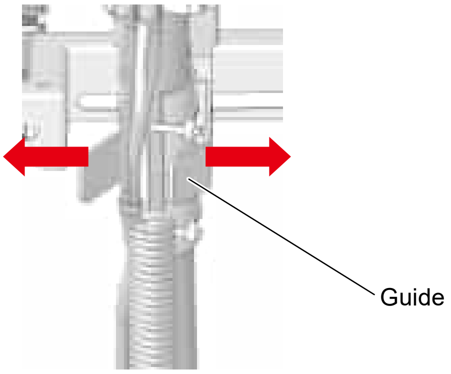

Cylinder
Plastic guide
Bolt A
Bolt B
U-guide

Cutter Swing Stop Position

- **Right/left adjustment**

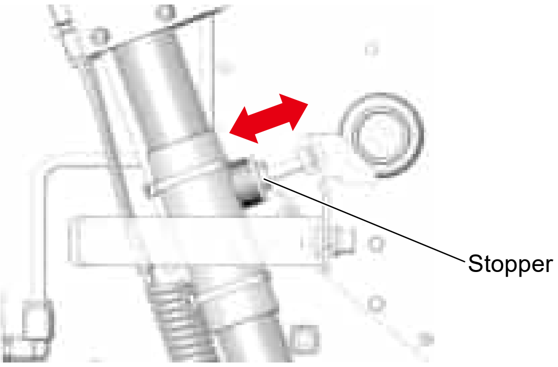
Adjust the right or left position of the guide shown in the diagram below so that, at the end of the cutter swing operation, position A in the diagram on the left is located between the take-up tube and the bearing center (R).


Cutter
Position A
Yarn guide lever



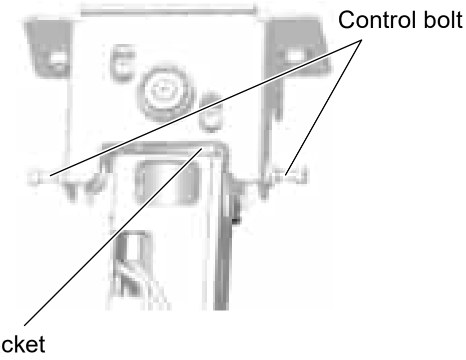
- **Forward/backward adjustment**

Move the stopper position to adjust the cutter swing amount.
During this adjustment, position it so that the end of the yarn can be held between the take-up tube and the bearing center.



Angle Control Bolt for Cutter Lever

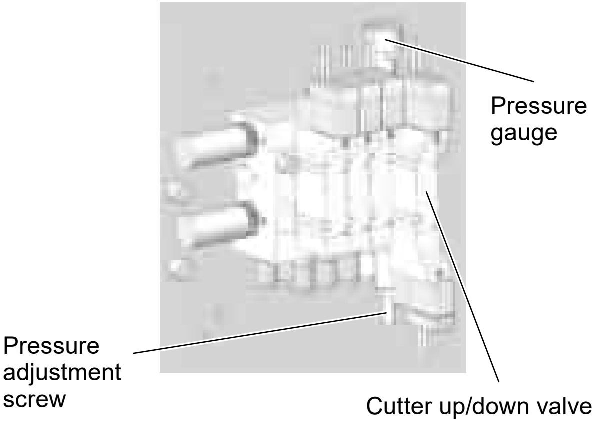
After adjusting the U-guide width and the cutter swing stop position (forward/backward, right/left), adjust the angle control bolt for the cutter lever.


Control bolt
Bracket

Up/Down Valve Pressure for Cutter

Pressure setting for up/down valve operation on cutter: 0.25 MPa

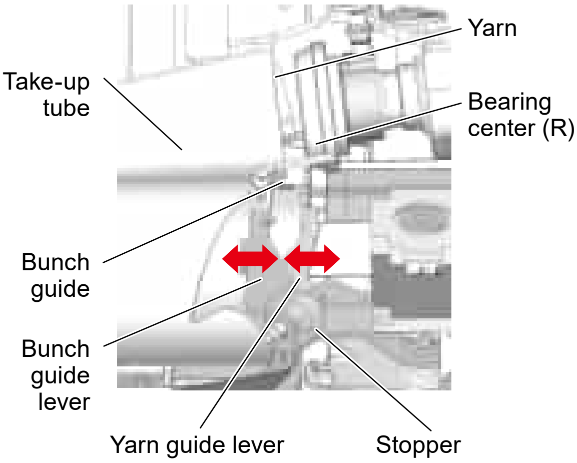
* When the pressure setting drops below 0.2 MPa, the valve may become inoperable. After setting, move the cutter up and down several times and check the pressure setting again.


Pressure gauge
Pressure adjustment screw
Cutter up/down valve

2-9 Yarn Guide Lever

Yarn Guide Lever Swing Amount

Set the appropriate position on the VOS, so that the yarn can be introduced between the bearing center (R) and the take-up tube.

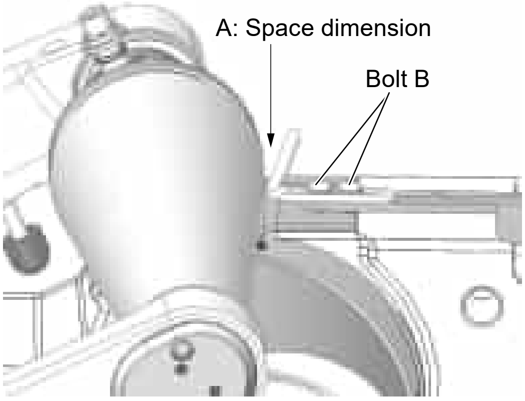

Yarn
Take-up tube
Bearing center (R)
Bunch guide
Bunch guide lever
Yarn guide lever
Stopper

Bunch Winding Position

The bunch guide lever can be swung to the left and the right by taking out or putting in the stopper screw. Adjusts the bunch winding po-sition which is positioned by the bunch guide.

Bunch Guide Length

Dimension A: = 2 mm ± 1 mm
Loosen bolt B to adjust.


A: Space dimension
Bolt B

Bunch Winding Length

Use the VOS to set the appropriate length for the bunch winding, which is performed on the take-up tube.

2-10 Belt Tension

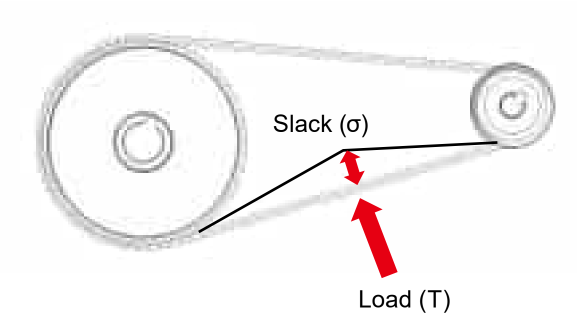
Default Tension for Each Timing Belt

[Camshaft]

Default tension value	95 to 165 N
Load (T)	7 to 11 N
Amount of slack (σ)	2.9 mm

[Opener]

Default tension value	125 to 215 N
Load (T)	9 to 14 N
Amount of slack (σ)	2.3 mm



2-11 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

[Basic settings]

Travel Command	Set the AD travel method
Travel Standby Pos.	Set the AD waiting position before the travel command
Auto Start Mode	Set the AD startup method
Alarm automatic recovery/startup function	Functions when an alarm occurs for which automatic recovery/startup can be carried out
Clmp Cutter No Inchng Mode	Settings related to the inching operation for the clamp cutter during manual mode
Tube Detectn Functn	Set the AD operation with or without the take-up tube on the stocker
Travel Speed	Set the AD travel speed
Travel deceleration timing	Sets the deceleration timing during indexing in for full packages

[Operation adjustment]

First W-Unit No.	Set the first winding unit No. on each zone
Last W-Unit No.	Set the last winding unit No. on each zone
Doffing operation	Sets the AD doffing operation
Bunch Winding Time	Set bunch winding length
SV Inching Time	Set the lowering time for the yarn insert on the clamp cutter
Opener Rising Stop Pos.	Set the opener stop position
Opener Wait Time	Set the waiting time for package ejection
Yarn guide lever forward stop position	Sets the yarn guide lever forward stop position for yarn insertion operation
Yarn guide lever reverse stop position	Sets the yarn guide lever reverse stop position after yarn insertion operation
Package Ejection Error alarm	Triggers an alarm when the package is unable to discharge to the rear
AD yarn insertion error determination criteria	Sets the signal when determining AD yarn insertion errors

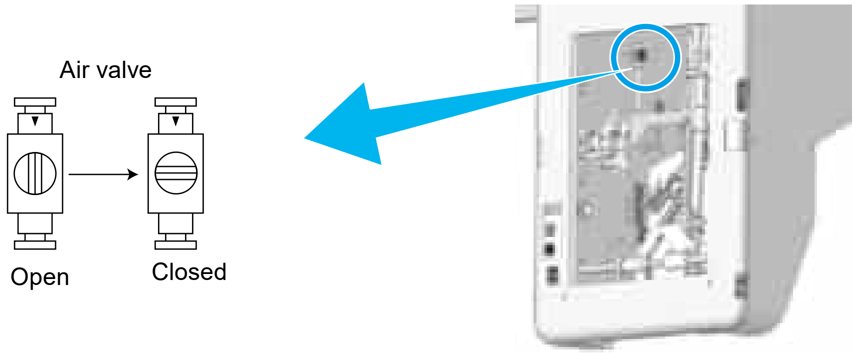
Sec 3 Maintenance

3-1 Before Maintenance & Inspection

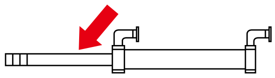
CAUTION

The machine operation must always be stopped before performing maintenance.

1. **Press the winder stop button.**
2. **Press the stop button on the AD operation panel.**
3. **Lower the circuit protector operation lever located on the left side of the AD.**
4. **Close the compressed air valve as shown in the diagram below.**



3-2 Inspection Item & Frequency

Frequency	Item	Guideline
Daily	Photoelectric tubes	Remove the cotton fly around the photoelectric tubes with an air gun * When cleaning the light receptor and the projector, wipe them clean with a dry, soft cloth or with a cloth moistened with water, or water diluted with mild detergent. Do not use alcohol based agents (thinner, benzine, etc.)
	Rail brushes	Remove the cotton fly from the brushes with an air gun
Monthly	Cutter	• Remove the cotton fly or any other contaminants with an air gun • Lubricate the cutter or the clamp plate axes * Use ISO VG10 or a comparable product (Recommend dry type)
Every 6 months	Inside AD	Remove all the covers from the AD and clean the chain and cam follower with an air gun **CAUTION** When cleaning the electrical equipment and suck out the cotton fly from the surrounding area of the electrical equipment, use a vacuum cleaner to suck out the cotton fly. Do not blast it with an air gun or compressed air. Using compressed air causes the cotton fly to get inside the machine leading to electrical equipment malfunction.
	Traveling chain	Lubricate the chain so that the oil gets in between the bush and pin * Use ISO VG68 or a comparable product (spindle oil is also ok)
Yearly	Air cylinder shaft 	Apply extreme-pressure lithium-based grease with mineral oil, NLGI No.2, to the shaft surface **CAUTION** Do not apply any grease which is not a lithium-based grease. If another type of grease is mixed with a lithium-based grease, the grease may harden and undergo a change in properties resulting in a reduction in the performance level of the grease.

3-3 Daily Inspection

Perform a daily inspection of the main frame, rails, pillars and cable chains, etc. Conduct a visual inspection and also check for any abnormal smells or sounds coming from these parts. In particular, be sure to check for any cotton fly buildup inside the cable chain duct, because it can cause the cable chain to fall off.
Using wax makes the AD more susceptible to accidental slipping. If the stopping performance becomes less precise or deteriorates, clean the traveling surface of the rails with a cloth moistened with water, or water diluted with mild detergent.

3-4 After Maintenance & Inspection

1. **Open the compressed air valve.**
2. **Raise the circuit protector operation lever located on the left side of the AD.**
3. **Press the winder start button.**
4. **If the AD automatic start mode is turned OFF, press the AD start button.**

● **Precautions**

- During inspection, ensure that you do not damage any functioning parts.
- After the inspection, ensure that the following steps have been undertaken before turning the AD power switch ON: All bolts that were loosened during the inspection have been securely tightened. All tools or measuring instruments that were used during the inspection have been removed. All wiring or cables that were disconnected during the inspection have been re-connected.

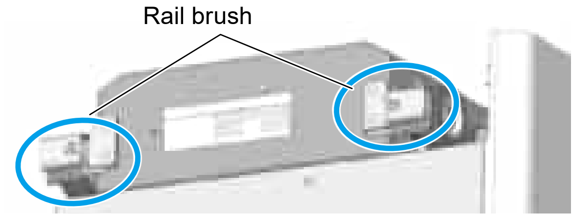
CAUTION

During and after the inspection, be sure to re-tighten the terminal bolts.

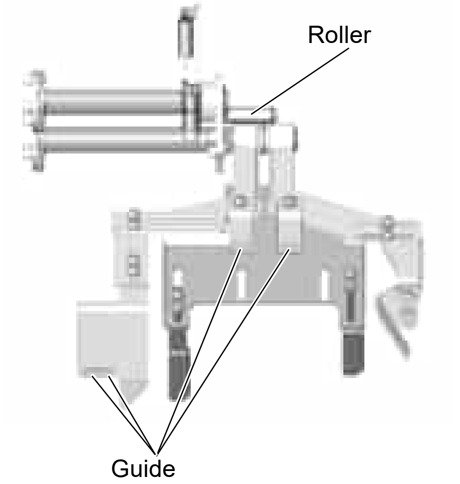
Sec 4 Consumables

If the parts below are worn causing a failure or problem, replace the worn part or parts with a new one.

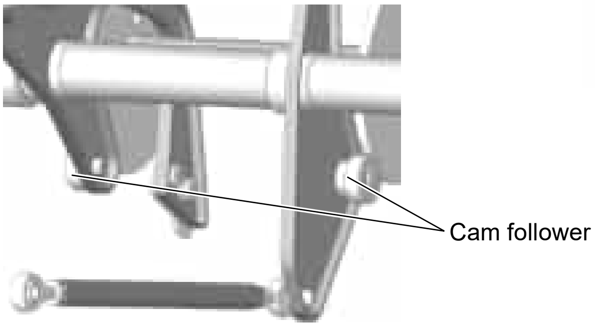
Traveling drive



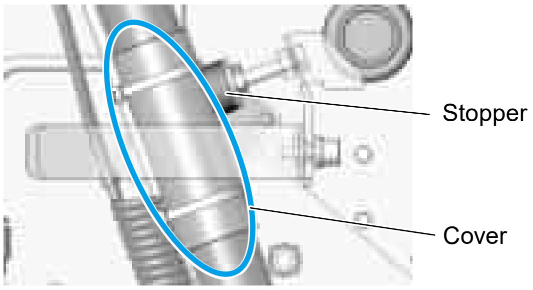
Tube separator

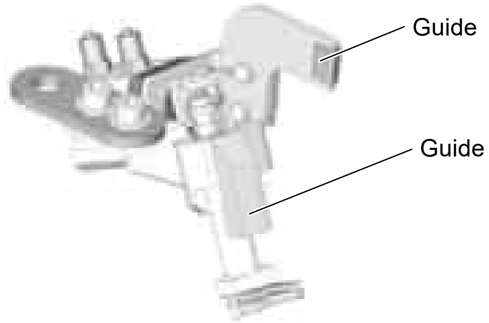

Roller
Guide

Camshaft


Cam follower

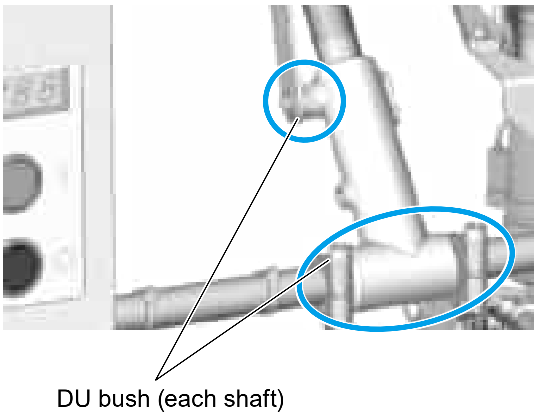
Yarn pickup cylinder & clamp cutter

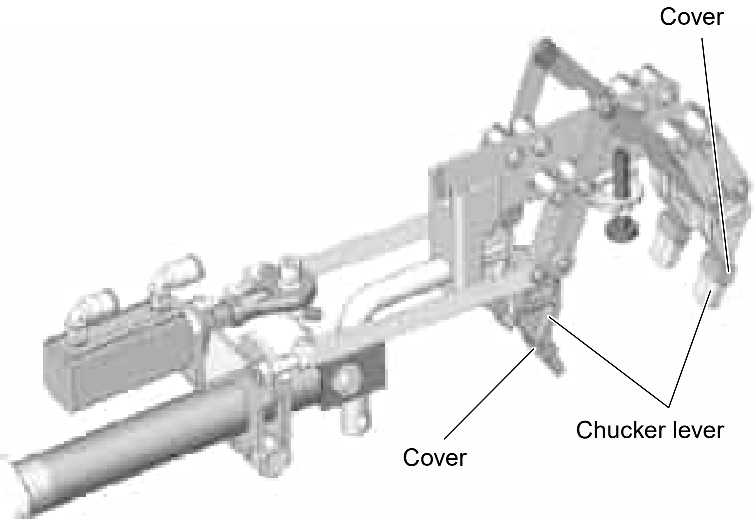

Stopper
Cover


Guide
Guide

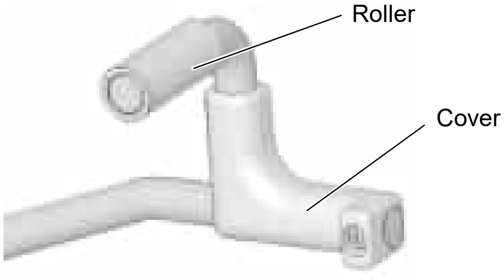
Chucker

Refer to the Parts Catalog for details.

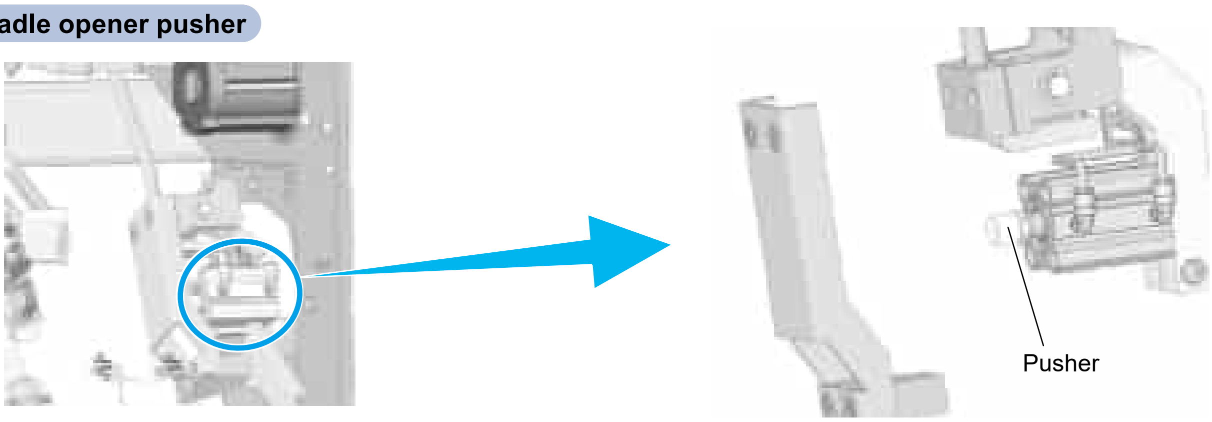

DU bush (each shaft)


Cover
Cover
Chucker lever

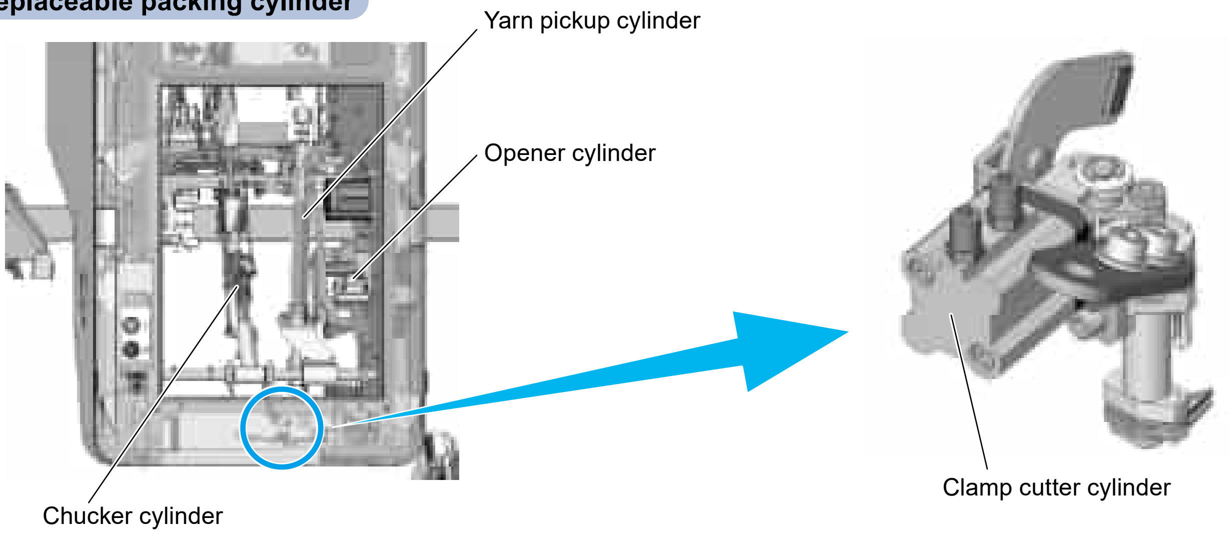
Cradle opener


Roller
Cover

Cradle opener pusher

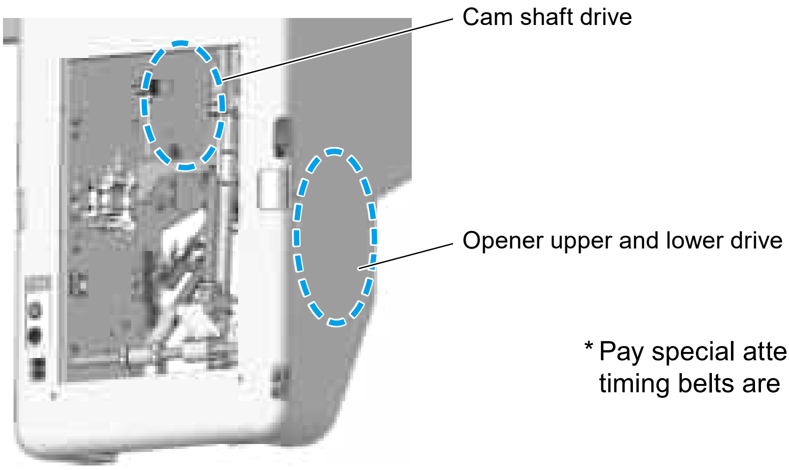


Replaceable packing cylinder


Yarn pickup cylinder
Opener cylinder
Chucker cylinder
Clamp cutter cylinder

* Select applicable packing from parts catalog.

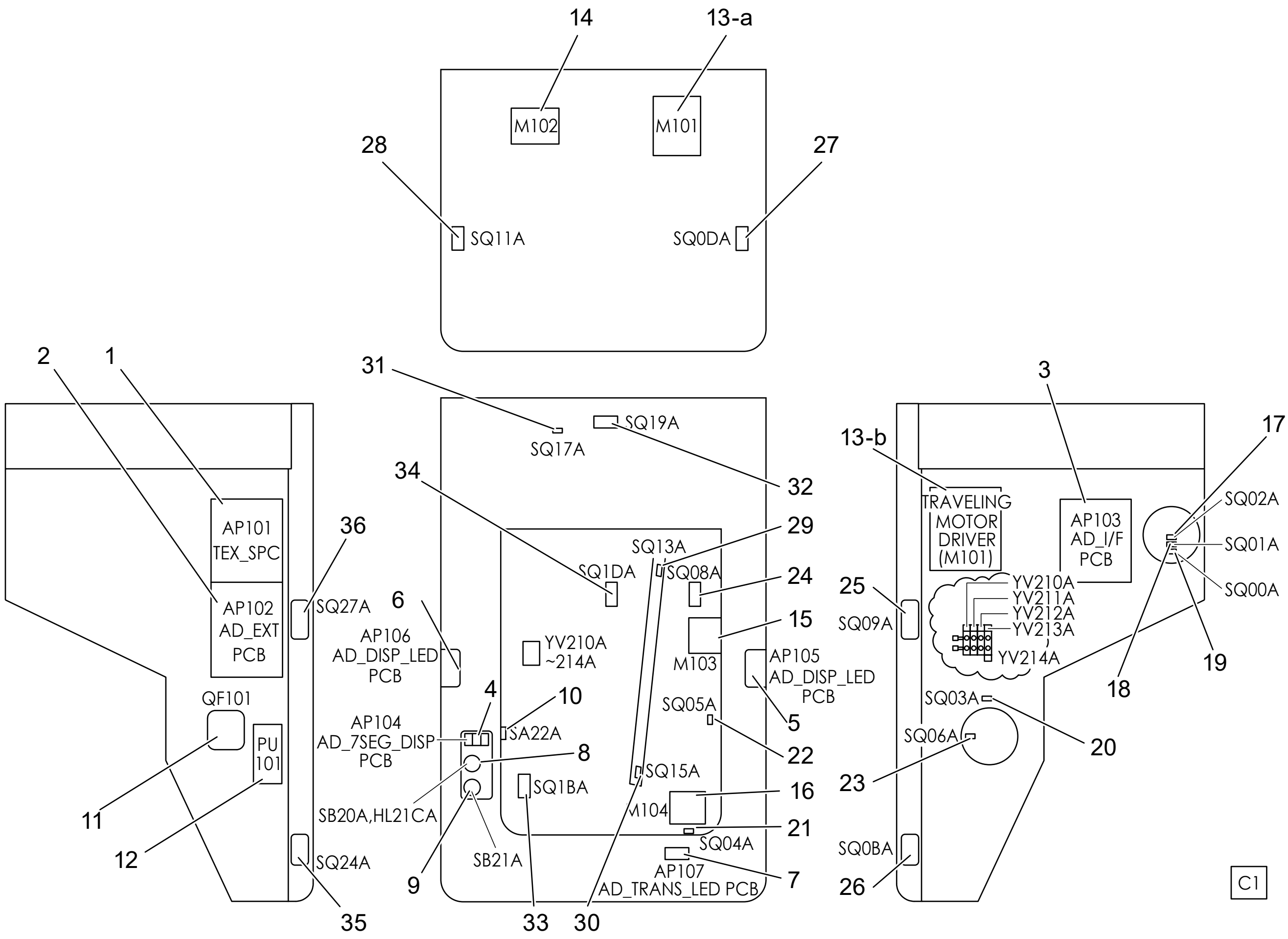
Timing belt


Cam shaft drive
Opener upper and lower drive

* Pay special attention when replacing as the two timing belts are different types.

Sec 5 Electrical Controls

5-1 Electrical Component Layout & Names



14
13-a
M102
M101
28
27
SQ11A
SQ0DA
2
1
31
3
SQ19A
SQ17A
32
13-b
17
34
TRAVELING MOTOR DRIVER (M101)
AP103 AD_I/F PCB
SQ02A
AP101 TEX_SPC
36
SQ13A
29
SQ01A
SQ1DA
SQ08A
24
25
SQ00A
AP102 AD_EXT PCB
SQ27A
6
YV210A
YV211A
YV212A
YV213A
15
SQ09A
AP106 AD_DISP_LED PCB
YV210A ~214A
YV214A
M103
AP105 AD_DISP_LED PCB
19
18
QF101
4
10
SQ03A
SQ05A
5
AP104 AD_7SEG_DISP PCB
SA22A
20
PU 101
8
22
SQ06A
11
SQ15A
23
SQ1BA
16
SB20A,HL21CA
M104
21
12
SQ04A
SQ0BA
SQ24A
SB21A
9
AP107 AD_TRANS_LED PCB
7
26
C1
35
33
30

[Electrical component layout & names]

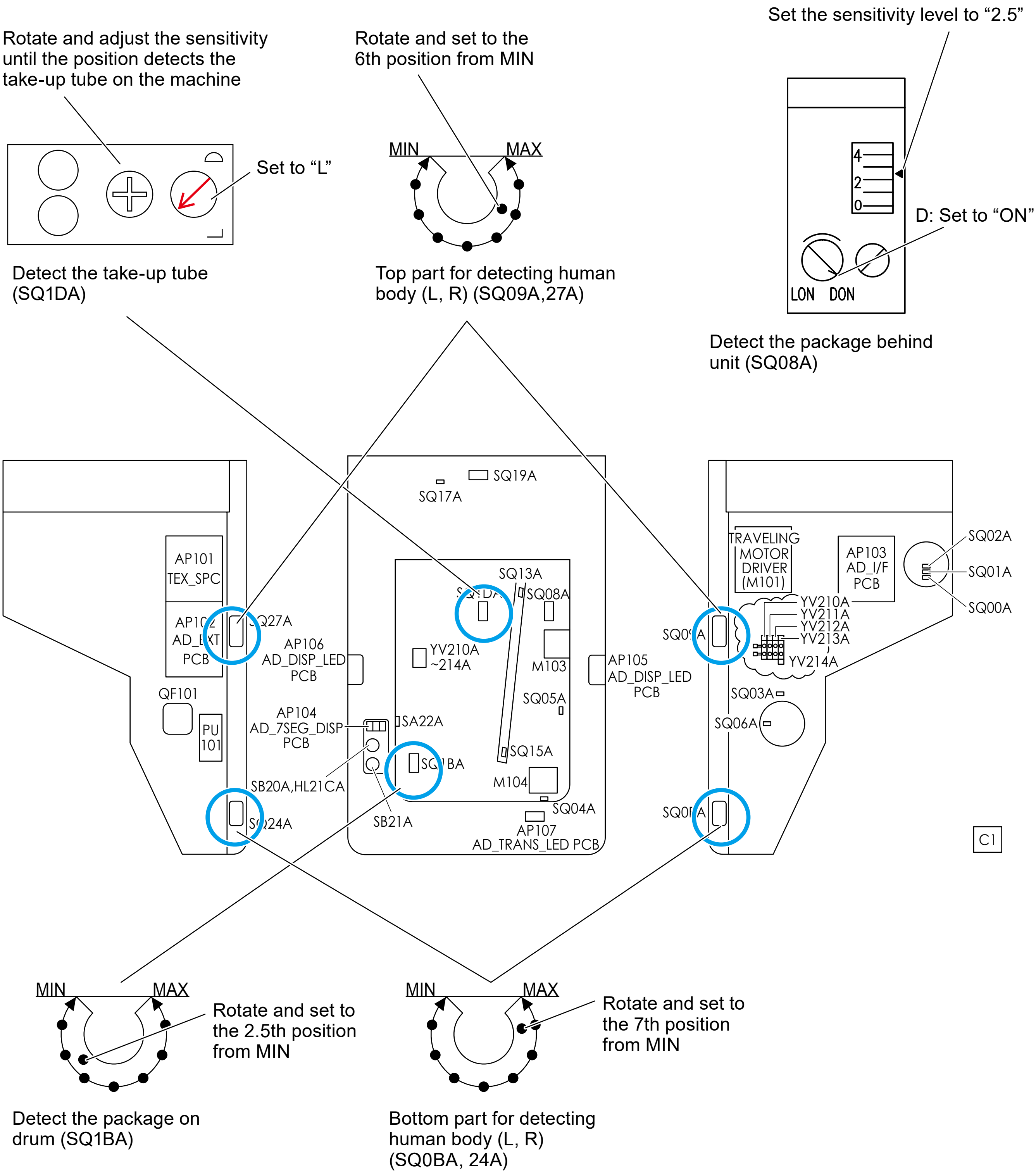
No.	Name	Code
1	Fiber SPC	AP101
2	Expansion board	AP102
3	I/F board	AP103
4	7SEG board	AP104
5	Display board	AP105
6	Display board	AP106
7	Unit communication LED	AP107
8	Start button	SB20A
9	Stop button	SB21A
10	Auto/manual mode switch	SA22A
11	Circuit protector	QF101
12	Switching power supply	PU101
13-a	Traveling motor	M101
13-b	Traveling motor driver	M101
14	Camshaft motor	M102
15	Opener motor	M103
16	Yarn guide motor	M104
17	Camshaft stop timing sensor (HALL IC)	SQ00A
18	Camshaft home position sensor (HALL IC)	SQ01A
19	Chucker and cutter timing sensor (HALL IC)	SQ02A
20	Opener home position sensor (HALL IC)	SQ03A
21	Yarn guide home position sensor (HALL IC)	SQ04A
22	Opener cylinder detection sensor (HALL IC)	SQ05A
23	Opener count sensor (HALL IC)	SQ06A
24	Package detection (unit rear) sensor (PHO)	SQ08A
25	Human body detection top sensor (right) (PHO)	SQ09A
26	Human body detection bottom sensor (right) (PHO)	SQ0BA
27	Return magnet detection (right) sensor (RS)	SQ0DA
28	Return magnet detection (left) sensor (RS)	SQ11A
29	Yarn pickup cylinder top-end detection sensor (PXS)	SQ13A
30	Yarn pickup cylinder bottom-end detection sensor (PXS)	SQ15A
31	Detection sensor for index plate engagement (PXS)	SQ17A
32	Index block count sensor (PXS)	SQ19A
33	Package detection (on drum) sensor (PHO)	SQ1BA
34	Take-up tube detection sensor (PHO)	SQ1DA
35	Human body detection bottom sensor (left) (PHO)	SQ24A
36	Human body detection top sensor (left) (PHO)	SQ27A

* Changes or additions to the codes may occur without prior notice.
PHO: Photoelectronic sensor
PXS: Proximity sensor
HALL IC: Hole IC
RS: Reed switch

5-2 Sensor & Controller Level Settings

The sensor and controller levels have already been set prior to shipment.
However, if there are any faulty parts that must be replaced, be sure to reset the sensor and controller levels.

Sensor



Rotate and adjust the sensitivity until the position detects the take-up tube on the machine

Set to “L”

Detect the take-up tube (SQ1DA)

Rotate and set to the 6th position from MIN

Top part for detecting human body (L, R) (SQ09A,27A)

Set the sensitivity level to “2.5”

D: Set to “ON”

Detect the package behind unit (SQ08A)

Rotate and set to the 2.5th position from MIN

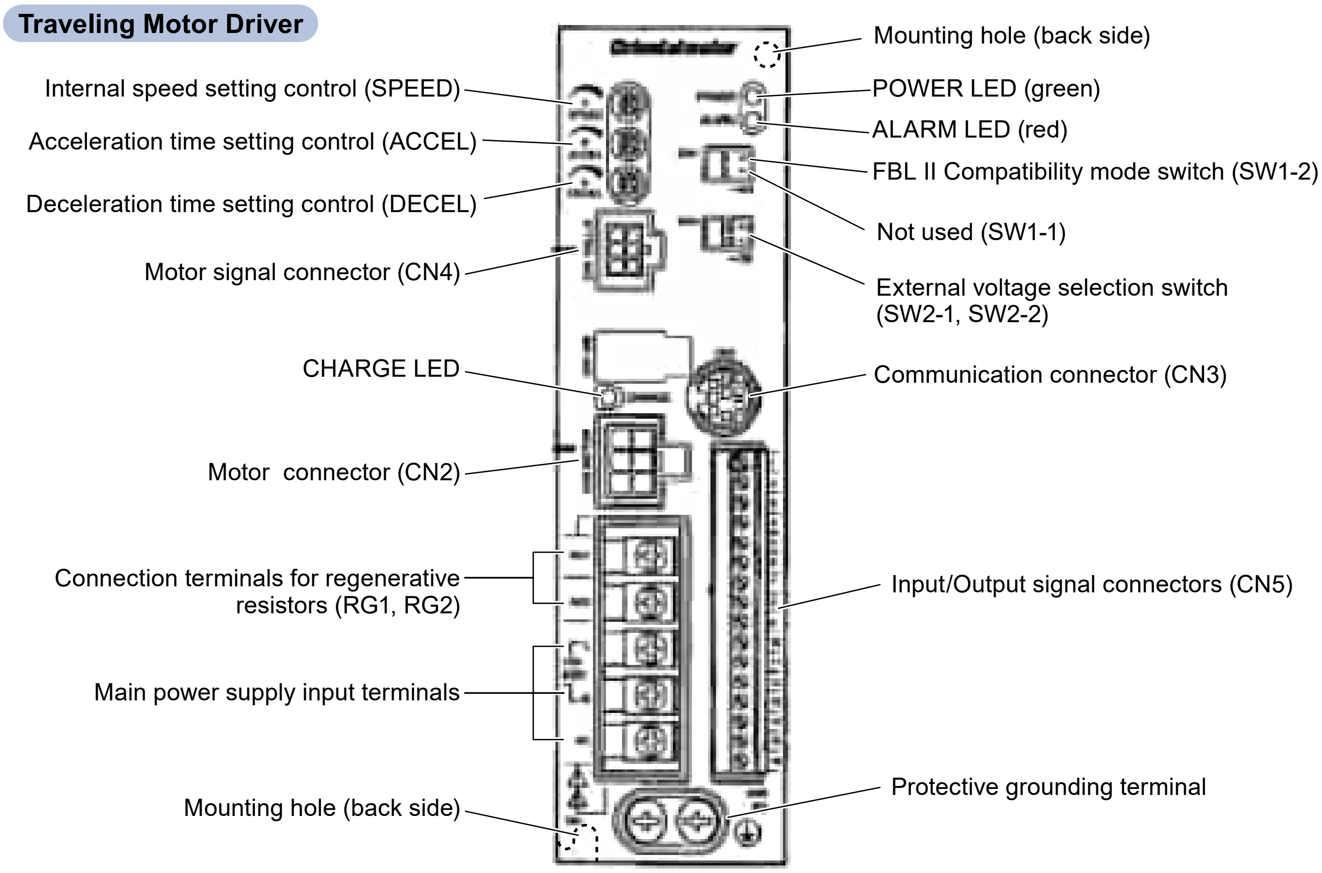
Detect the package on drum (SQ1BA)

Rotate and set to the 7th position from MIN

Bottom part for detecting human body (L, R) (SQ0BA, 24A)

MIN
MAX
4
2
0
LON
DON
AP101
TEX_SPC
AD_EXT
PCB
Q27A
AP106
AD_DISP_LED
PCB
QF101
PU
101
AP104
AD_7SEG_DISP
PCB
SB20A,HL21CA
24A
SQ19A
SQ17A
SQ13A
SQ08A
YV210A
~214A
M103
SQ05A
SA22A
SQ15A
M104
SQ04A
SB21A
AP107
AD_TRANS_LED PCB
AP105
AD_DISP_LED
PCB
TRAVELING
MOTOR
DRIVER
(M101)
AP103
AD_I/F
PCB
SQ02A
SQ01A
SQ00A
YV210A
YV211A
YV212A
YV213A
YV214A
SQ03A
SQ06A
C1

Traveling Motor Driver


Internal speed setting control (SPEED)
Acceleration time setting control (ACCEL)
Deceleration time setting control (DECEL)
Motor signal connector (CN4)
CHARGE LED
Motor connector (CN2)
Connection terminals for regenerative resistors (RG1, RG2)
Main power supply input terminals
Mounting hole (back side)
Mounting hole (back side)
POWER LED (green)
ALARM LED (red)
FBL II Compatibility mode switch (SW1-2)
Not used (SW1-1)
External voltage selection switch (SW2-1, SW2-2)
Communication connector (CN3)
Input/Output signal connectors (CN5)
Protective grounding terminal

Name	Description
Internal speed setting control [SPEED]	Sets the rotation speed of the motor
Acceleration time setting control [ACCEL]	Sets the acceleration time during motor startup
Deceleration time setting control [DECEL]	Sets the deceleration time for motor stoppage
POWER LED (green)	Lights up when the main power is turned on
ALARM LED (red)	Flashes when the protective function is enabled
Motor signal connector (CN4)	Signal cable connection
FBL II Compatibility mode switch (SW1)	SW1-1: Not used. SW1-2: Sets the FBL II compatibility mode
External voltage selection switch (SW2)	SW2-1: Selects the power supply for the input signal Selects the external or internal power supply on the driver
	SW2-2: Switch to match the external DC voltage Select DC5 V or DC10 V
CHARGE LED (red)	• Lights up when the main power is turned on • Goes off when internal remained voltage decreases to the safety level after turning off the main power
Motor connector (CN2)	Motor cable connection
Connection terminals for regenerative resistors (TB1) [RG1, RG2]	Connection for the optional regenerative resistor EPRC-400P (sold separately)
Main power supply input terminals (TB1) [L, N] (Single phase input) [L1, L2, L3] (3 phase input)	Main power supply connections • Single phase 100 – 120 V: Connect the single phase 100 – 120 V to L and N • Single phase 200 – 240 V: Connect the single phase 200 – 240 V to L and N • 3 phase 200 – 240 V: Connect the 3 phase 200 – 240 V to L1, L2 and L3
Communication connector (CN3)	Connection for the data setting control OPX-2A
Input/Output signal connectors (CN5)	Connection when using an external power supply for input/output signals • Connects input/output signals for the programmable controller, etc. • Connects the thermostat output for the regenerative resistor EPRC-400P (optional and sold separately) • Connects the external speed setting control (included)
Protective grounding terminal	Use an AWG 18-14 (0.75 – 2.0 mm^2) ground wire

* You can change to the same settings as the FBL II Series by using the FBL II compatibility mode.

5-3 Alarm Description

Alarm Type	Signal Lamp	Details
DC24 V Power Check	Lit	There is a DC24 V power fault on the AD (short circuit, etc.)
DC5 V Power Check		There is a DC5 V power fault on the AD (short circuit, etc.)
Communication Error	Flashing	A communication error occurred between the AD and the SPC on the machine
Cylinder Sensor Alarm	Lit	A sensor error occurred on the yarn pickup cylinder for the AD
Cylinder Raise Cycle Error		An error occurred when the yarn pickup cylinder for AD raised
Cylinder Lower Cycle Error		An error occurred when the yarn pickup cylinder for AD lowered
Yarn pickup cylinder operation error during chucking		The AD yarn pickup cylinder remains lowered after chucking operation
Lower yarn pickup error		Lower yarn pickup error after the AD yarn pickup cylinder lowers
Camshaft irregular rotation 1		The camshaft rotation is irregular during forward movement after the AD yarn pickup cylinder reaches the bottom end
Camshaft irregular rotation 2		The camshaft rotation is irregular during reverse movement after the AD yarn pickup cylinder clamp operation
Camshaft irregular rotation 3		The camshaft rotation is irregular during chucking operation after the AD yarn pickup cylinder finishes rising
Camshaft irregular rotation 4		The camshaft rotation is irregular during return to home position after chucking operation is complete
Doffing Cycle Time Over		The doffing operation was not completed within the set time period
Home position deviation alarm (power outage during doffing)		The AD suffers a power outage during doffing
AD - unit communication error		A communication error between the AD and unit
Package Ejection Error		A package was left on the drum even though the opener on the AD was opened
Camshaft Not In Home Position Alarm		The home position sensor on the AD camshaft is still turned OFF
Chuck Error Alarm (Stocker)		The AD chucker did not clamp the take-up tube correctly, and it is stuck on the stocker
Chuck Error Alarm (On Drum)		The take-up tube is not being chucked correctly
Yarn threading error		The yarn detection signal is unstable during bunch winding
Yarn Guide Lever Not In Home Position Alarm		The home position sensor for the yarn guide lever should be ON but it is still OFF
Opener Not In Home Position Alarm		The home position sensor for the opener should be ON but it is still OFF
Opener Open/Close Operation Alarm		The opener does not open/close correctly.
Opener operation error		The opener is not operating correctly
Yarn guide lever home position deviation during travel		The yarn guide lever home position sensor does not turn ON while the AD is traveling
Yarn guide operation error alarm		The yarn guide lever is not operating correctly
Human Body Detection Sensor Damage		The AD travel operation is enabled, but the human body detection sensor is still turned ON

Alarm Type	Signal Lamp	Details
Index Count Sensor Alarm	Lit	The index count sensor for the AD remains ON (or OFF) during the travel operation
Take-up Tube Detection Sensor Damage		The take-up tube detection sensor for the AD remains ON (or OFF) during the travel operation
Index Out Error		The index plate for the AD is not released
Collision prevention sensor damaged alarm		The collision prevention sensor remains ON
Index in error		The index plate is not fitting into the index block
Traveling Motor Alarm		An error occurred on the traveling motor for the AD
Overrun Alarm		The AD travelled for more than 15 seconds after switching to low speed
Travel defect alarm		An obstacle is preventing the AD from traveling correctly
Stop button contact error		A stop button contact error has occurred

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Spin Inspector Type-B

Contents

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  - 1-1 Part Names & Bobbin Flow
  - 1-2 Functions of Each Part

2 **Adjustment Standard** 3
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  - 2-3 Inspector Conveyor

3 **Maintenance** 4
  - 3-1 Inspection & cleaning

10b
Chapter

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Sec 1 Mechanism

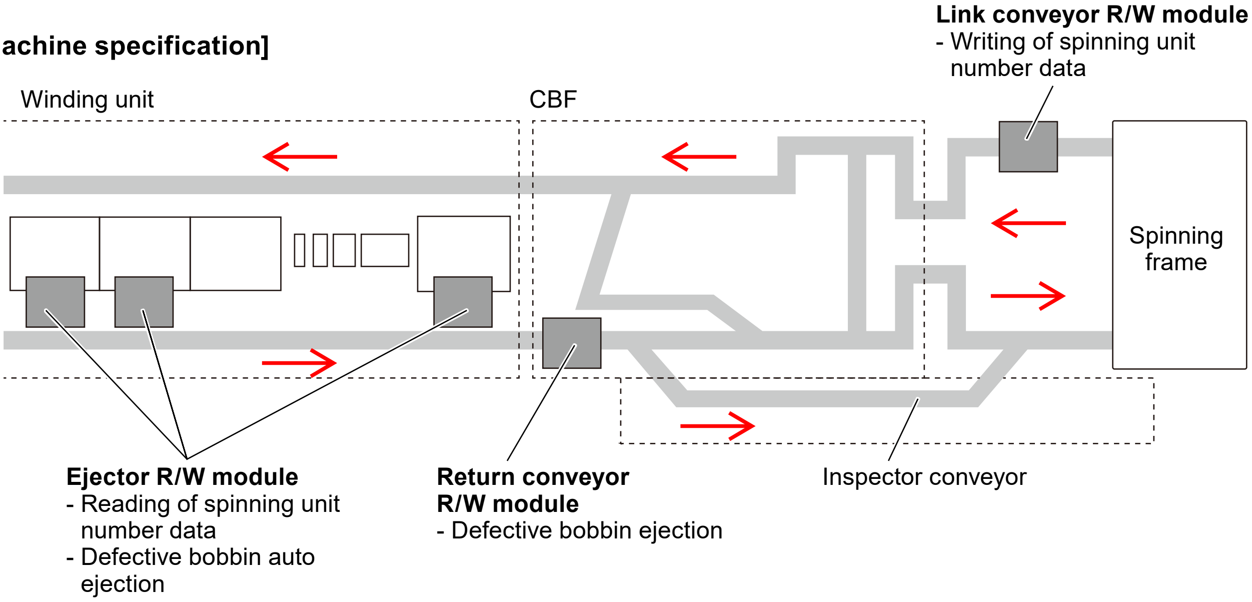
In the event that a defective bobbin is detected on the winder during winding, the spin inspector system is able to diagnose which spindle on the spinning frame produced the defective bobbin.

1-1 Part Names & Bobbin Flow

1. **If the defective bobbin alarm, which is set beforehand (Refer to Chapter 10b, 2-1), is triggered, the spinning unit number that produced the defective bobbin is detected by the winding unit and the defective bobbin is automatically ejected.**
2. **The bobbin that is automatically ejected from the return conveyor is separated onto the inspector conveyor.**

* The accumulated defective bobbin data can be viewed from the VOS screen.

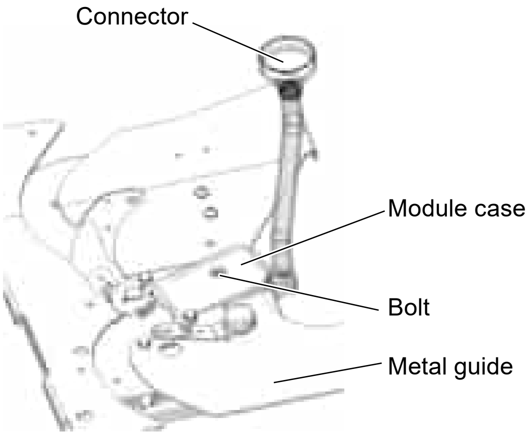
[L machine specification]


Link conveyor R/W module
- Writing of spinning unit number data
Winding unit
CBF
Spinning frame
Ejector R/W module
- Reading of spinning unit number data
- Defective bobbin auto ejection
Return conveyor R/W module
- Defective bobbin ejection
Inspector conveyor

1-2 Functions of Each Part

Ejector R/W Module

This PCB is for communicating with the tray's ID tag.
It is located inside the module case.

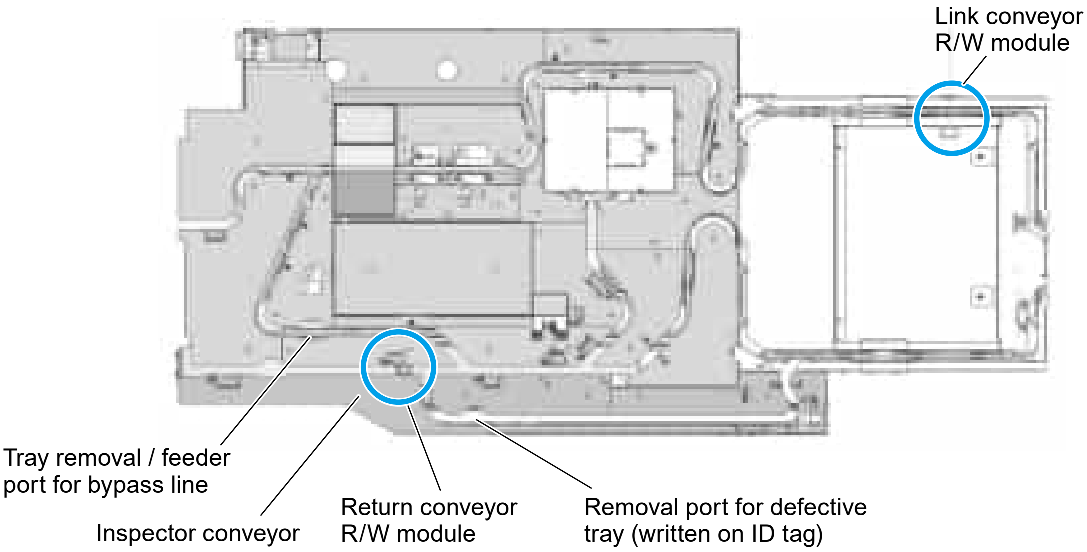

Connector
Module case
Bolt
Metal guide

Link Conveyor R/W module (Writer Unit)

This unit writes the spinning unit number data to the tray ID tag.

Return Conveyor R/W module (Reader Unit)

The ejection flag, which is written on the tray's ID tag, is read and then the bobbin is separated onto the inspector conveyor.


Link conveyor R/W module
Tray removal / feeder port for bypass line
Inspector conveyor
Return conveyor R/W module
Removal port for defective tray (written on ID tag)

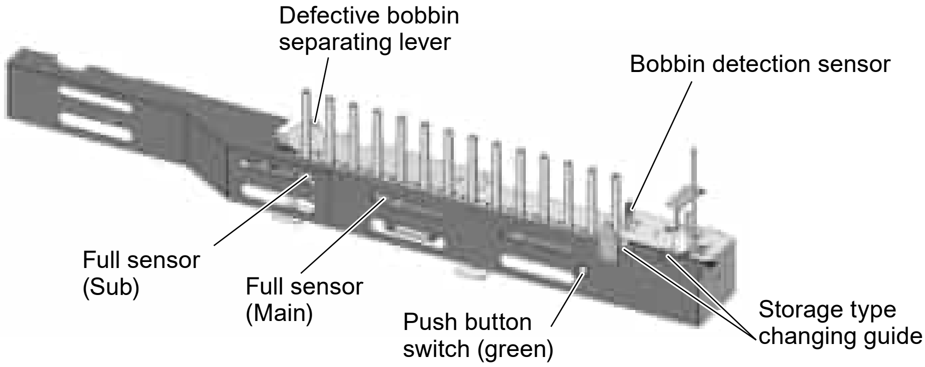
Inspector Conveyor

This conveyor carries the defective bobbins.
Defective bobbins remain stored on this conveyor until removed by the operator. The defective bobbins are accumulated on the inspector conveyor until it is full, at which time the rotating warning light (yellow) on the machine's out-end (OE) comes on to remind the operator that they should be removed as described below.

1. **Remove the defective bobbins from their trays, and replace them with empty bobbins.**
2. **Push the push button switch (green).**

CAUTION

When the inspector conveyor is full with defective bobbins, even if a defective bobbin is ejected, bobbins will not be separated onto the conveyor. In this situation, the bobbins will wait at the reader until the full status for the inspector conveyor is reset.


Defective bobbin separating lever
Bobbin detection sensor
Full sensor (Sub)
Full sensor (Main)
Push button switch (green)
Storage type changing guide

* The defective bobbin can be ejected out from the machine by adjusting the guide position. Insert the tray that is ejected out from the machine into the bypass line tray removal / feeder port.

Sec 2 Adjustment Standard

2-1 VOS Settings

The VOS settings are listed below. Change the setting conditions when necessary.

Spin inspector R/W device	Select “ON”
Forced ejection (YCA alarm)	Set the alarm for the data you wish to save using the spin inspector function. ● **REMOVE (1) Alarm reset** The unit removes the defective yarn length, ejects the defective bobbin and continues the winding operation. ● **REMOVE (2) Alarm stop** The unit removes the defective yarn length, ejects the defective bobbin and stops operation due to the alarm. After removing the winding package and threading the yarn, the alarm can be reset.
Forced ejection (PC/CLUSTER/IPM alarm)	
Forced ejection (MOIRE alarm)	
Forced ejection (CV alarm)	
Forced ejection (FF/DM alarm)	
Forced ejection (H/SFI alarm)	
Forced ejection (IPI alarm)	
Forced ejection (CMT alarm)	
Forced ejection (YF alarm)	
Forced ejection (MF/FF-CLUSTER alarm)	
Forced ejection (PP/P alarm)	
Forced ejection (OTHER alarm)	

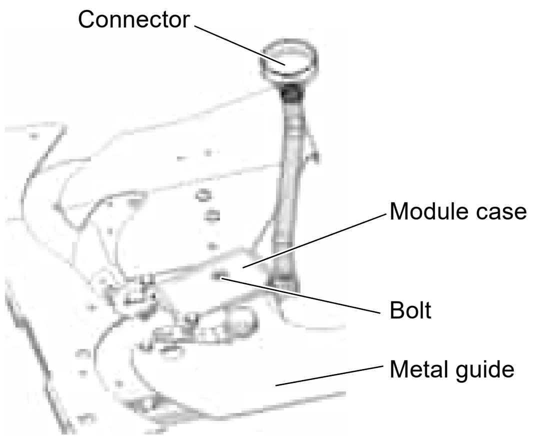
* Refer to Chapter 7, Section 5 for details on the SQC trend, SQC log and Target inspector.

2-2 Ejector R/W Module

No special adjustment is required except when the ejector is removed.

When the entire ejector is removed

1. **Disconnect the cables for the module on the connector section.**
   The procedure is the same as the cables for the ejector.
2. **Remove the entire ejector.**
   * Refer to Chapter 4Pa/4Pb for details on the ejector adjustment and maintenance.



When removing only the metal guide on the ejector

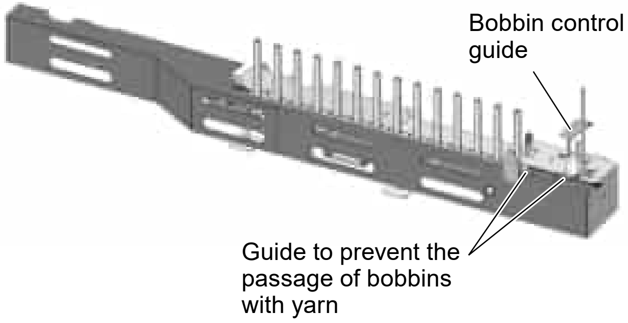
1. **Loosen the bolt.**
2. **Remove the module case.**
3. **Remove the metal guide.**
   * There is no need to disconnect the module case cables.

2-3 Inspector Conveyor

Adjust the items below after replacing the full bobbins separated onto the inspector conveyor with empty bobbins.

- **Bobbin control guide**
  Adjust so that empty bobbins pass through smoothly

- **Guide to prevent the passage of bobbins with yarn**
  Adjust so that only empty bobbins pass through

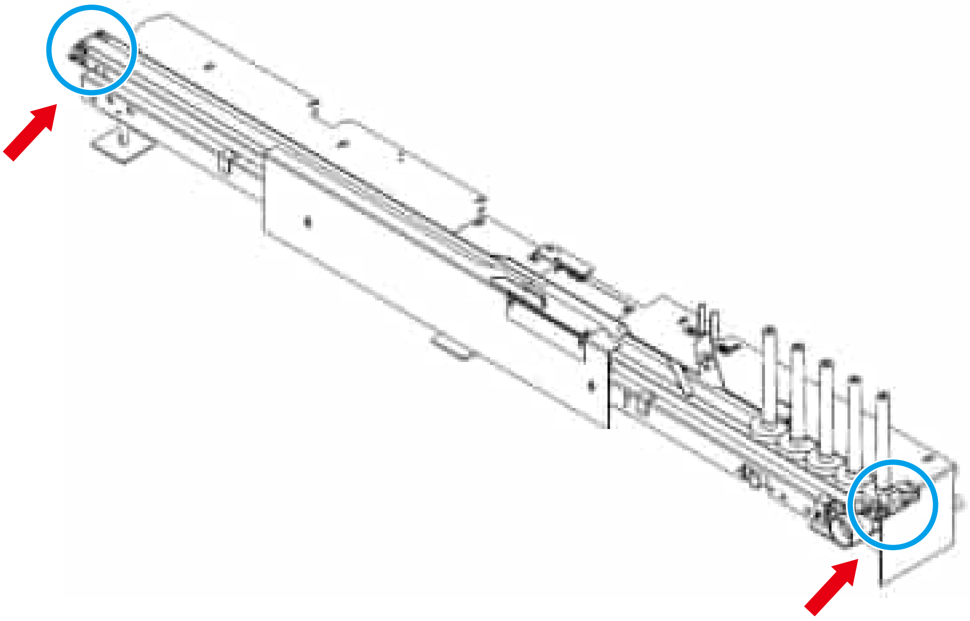


Sec 3 Maintenance

3-1 Inspection & cleaning

If yarn waste or cotton fly buildup, it can cause motor damage or the belt to crack.
Clean periodically once a month.

* With the machine stopped, remove the cover and remove any yarn waste and cotton fly buildup inside.



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